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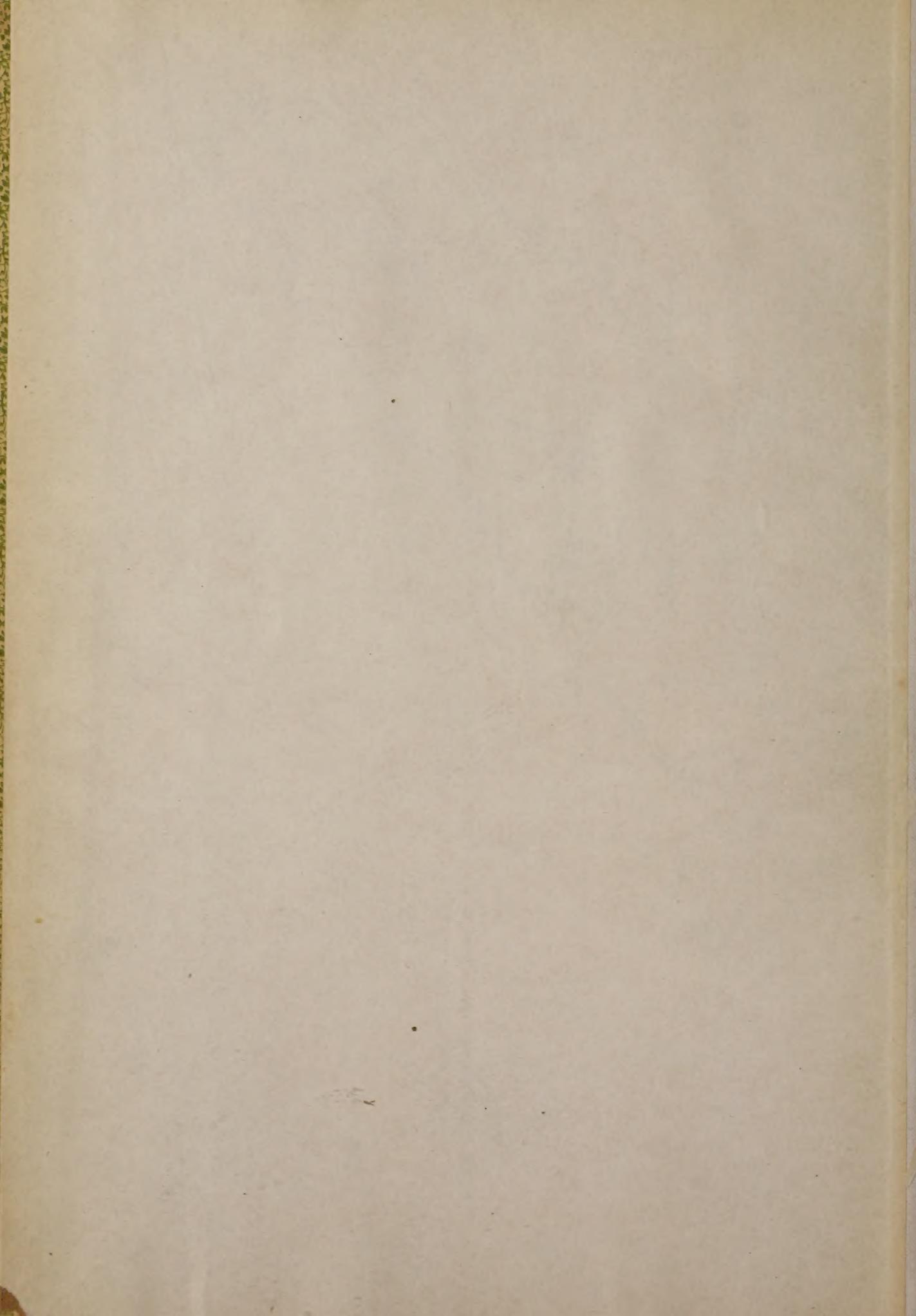
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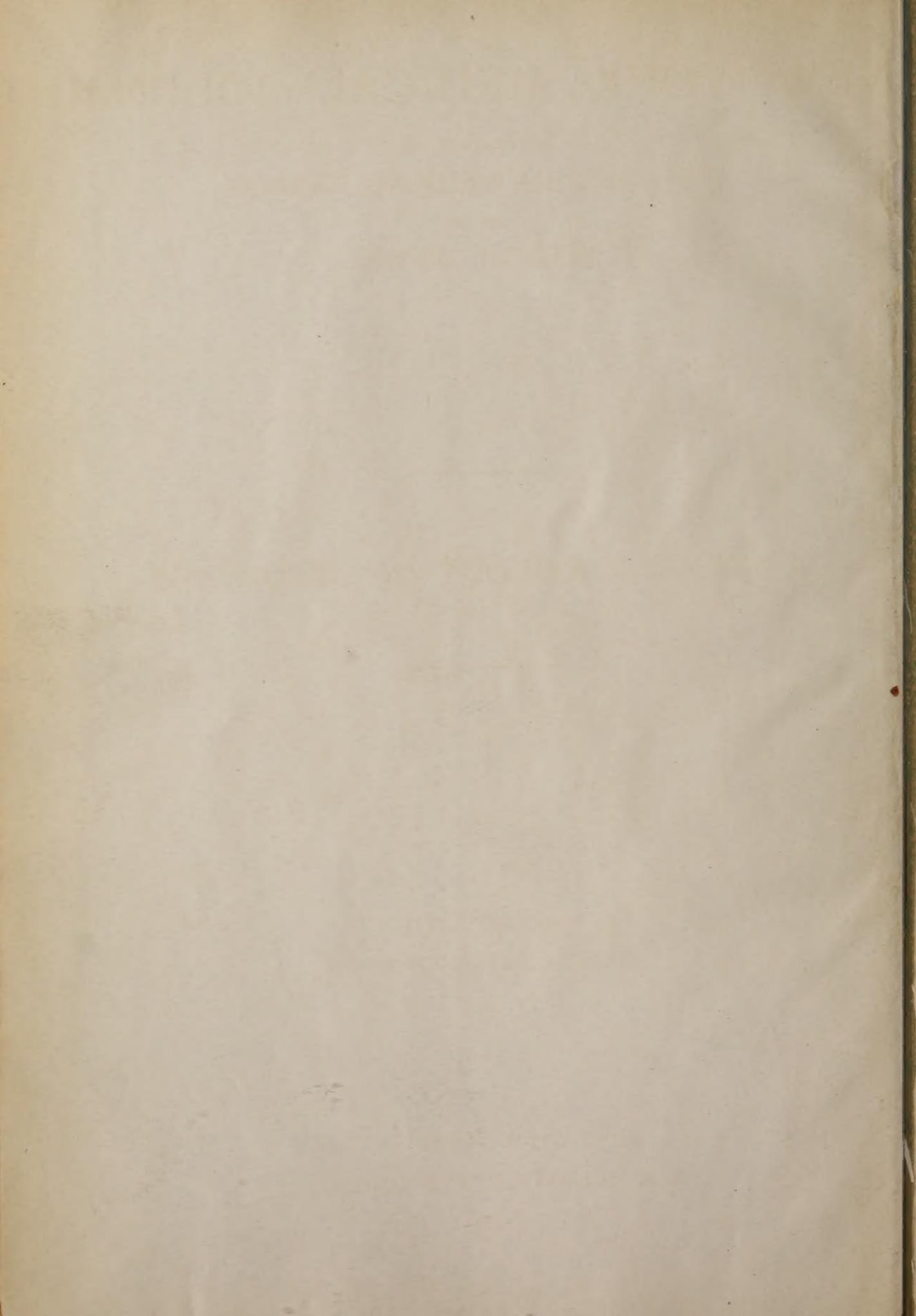
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THE DIAGNOSIS AND TREATMENT OF GALLBLADDER AFFECTIONS.*

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In a paper on Ischochymia Simulating Gallstone Disease (1), published a number of years ago, I presented reports of several cases in which the patients had had typical attacks of what was apparently gallstone colic, some with slight jaundice. The real trouble, however, was not in the gallbladder, but in the pylorus or the duodenum. Later I described a case (2) of duodenal ulcer, in which the symptoms and previous treatment for many years had been those of distinct cholelithiasis. In this patient the newer methods of diagnosis indicated that we had to deal with a duodenal ulcer. An operation disclosed the presence of the ulcer but failed to find any abnormal condition of the gallbladder. It is thus evident that a correct diagnosis in gallbladder lesions is not always an easy matter, and their characteristic symptoms are sometimes misleading. I thought, therefore, it would be of interest to broach the subject of gallbladder affections.

Almost all gallbladder diseases are intimately connected with gallstones; either they predispose to the formation of the latter, or the calculi are the cause of the lesion. It will, therefore, be appropriate to state a few well known facts regarding gallstones. The formation of gallstones is due, according to Naunyn, to bacterial infections of the gallbladder. Aschoff and Bacmeister (3) accept this view in a general way, but mention that some cholesterol stones originate without the aid of bacteria, but are solely due to stagnation of bile in the gallbladder.

Gallstones are found in ten per cent. of all autopsies performed in adults. Not all gallstone carriers, however, manifest morbid symptoms. It is generally assumed by clinicians that about five per cent. of these carriers at one time or another are troubled with mild or severe lesions, due to the biliary calculi. Kehr, one of the greatest gallbladder surgeons, maintains that but one per cent. of the gallstone carriers ultimately require surgical aid to remedy the gallstone disease. In contrast to this

view a great many surgeons believe that all gallstones are pathological and accompanied by symptoms, which are frequently not recognized. Gallstones are much more frequently found in women than in men, and principally in women who have gone through pregnancies.

After these preparatory remarks, returning to the diseases of the gallbladder, we can practically divide them as follows: 1, Acute cholecystitis, without and with jaundice; 2, chronic or recurrent cholecystitis, without and with stones; 3, empyema of the gallbladder, usually with ulcerations; and 4, malignant diseases of the gallbladder.

Inasmuch as the diagnosis must be based on the symptoms in conjunction with the objective findings, it will be best first to sketch the important symptoms before discussing the diagnosis of the different gallbladder lesions.

1. *Acute cholecystitis.*—There are present fullness and distress in the right hypochondrium; anorexia and sometimes slight icterus; no fever or a moderate rise in temperature for a few days.

2. *Recurrent or chronic cholecystitis.*—There exists a repetition of the same symptoms with increased severity and duration or typical attacks of severe colicky pains of comparatively short duration occur, usually in the right hypochondrium, radiating to the back and upward. Stones in the cystic duct are ordinarily accompanied by the symptoms of recurrent cholecystitis. Here, however, the attacks of colicky pain play a more predominant part; jaundice of a mild degree may occur. Stones in the choledochus and common duct present symptoms similar to those in the cystic duct, with the addition of jaundice. The latter is present in varying degree, depending upon the completeness of the obstruction and upon the length of time the stone became incarcerated.

3. *Empyema of the gallbladder* presents an irregular septic temperature; severe pains in the right hypochondrium; rigidity of the right rectus; extreme tenderness on pressure of the right upper abdomen; marked swelling of liver. The blood reveals a leucocytosis and an increase of the polynuclear cells. In addition to the very severe colicky cramps the patient suffers almost continuously and presents the characteristics and appearance of general septicemia.

4. *Malignant disease of the gallbladder.*—Cancer of the gallbladder is present for a considerable time without showing symptoms. The latter result from

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complications involving other organs, namely the bile ducts, causing icterus, or the pylorus, or duodenum, giving rise to isochochymia.

In making a diagnosis of gallbladder lesions it is of first importance to recognize in a general way the organ affected and then, if possible, to make

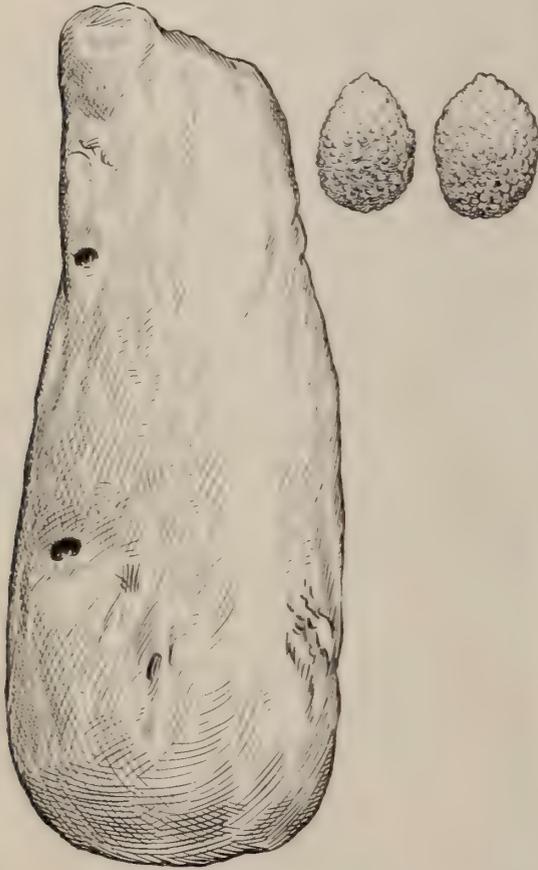


FIG. 1.—Gallbladder of patient C. A., and two stones, natural size.

a more detailed statement with regard to the special disease present. The diagnosis is comparatively easy, when the affections of the gallbladder run a typical course, but extremely difficult when they appear, as they frequently do, in disguised forms. It is principally in these latter conditions that we must avail ourselves of all the more refined methods in order to come to a correct conclusion.

In addition to a consideration of the subjective symptoms and a physical examination, we make use of the x ray apparatus, and employ the duodenal tube and the duodenal bucket and string. The röntgen examination consists of a direct investigation of the gallbladder region, 1, to determine whether visible shadows can be detected; 2, to ascertain the position of the duodenal cap and duodenum after a bismuth or barium test meal, in order to see whether these portions of the intestinal tract occupy their normal positions or are distorted by the interference of the gallbladder lesion; 3, to ascertain if there are any stones in the gallbladder causing a depression of the cap; or adhesions between the former organ and duodenum and pylorus producing a lengthening of the pylorus and duodenum with a dragging away to the right.

Negative x ray findings with regard to the gallbladder do not mean much, for the majority of gallstones do not throw shadows on the screen. Again, the accidental study of a biliary calculus by the x ray, in a patient who does not present any symptoms of gallbladder disease, will simply show that the individual in question is a gallstone carrier.

The direct examination of the bile, obtained from the duodenum, in the fasting condition of the patient, is of great importance for the diagnosis of gallbladder lesions.

While normally the bile, as found in the duodenum when fasting, has a golden yellow appearance and is clear, in pathological conditions of the biliary apparatus it is turbid, greenish yellow or dark brown in color and contains mucus, pus, frequently bacteria and cocci, as well as accumulations of cholesterin and bilirubin calcium crystals. The greater the deviations from the normal, golden yellow and clear, with regard to the turbidity and color, usually the more severe the gallbladder affection.

In cholecystitis, without the presence of stones, turbidity of the bile with mucus and pus are found. In cholecystitis with stones, microscopically, numerous cholesterin and calcium bilirubin crystals are encountered in addition to the mucus and pus.

In complete obstruction of the choledochus and of the common duct there is no bile present, even after prolonged aspiration or duodenal lavage. In common duct obstruction the pancreatic secretion is likewise not found.

The duodenal bucket and string test are useful in the differential diagnosis, especially with regard to the presence or absence of a peptic ulcer. Clear bile obtained by the duodenal tube (or found as such in the bucket) and a distinct blood stain on the string speak for peptic ulcer and a normal gallbladder. Turbid bile with no stain on the string indicates the presence of a gallbladder affection. Turbid bile and a marked blood stain on the string rather point to a double affection, namely peptic ulcer and cholecystitis.

As examples of the aid these newer methods furnish in making a correct diagnosis, I shall describe the following three cases, which I have recently observed:

CASE I.—B. 111-22-20. In October, 1916, the patient had an irregular heart action with shortness of breath when walking for the previous three weeks; he had no pain. The next attack occurred during October, 1918. In November, 1918, the patient consulted me on account of distress and heartburn, which occurred one to two hours after meals. He also complained of slight diarrhea. An examination of the stomach on November, 1918, showed: hydrochloric acid +; acidity, 80.

Since October, 1919, the patient had some difficulty in breathing, principally after meals. On March 8, 1920, the patient woke up with a severe pain in the upper abdomen and he vomited for five hours. The pain radiated to the left shoulder and arm. The next day the patient had a similar attack, for which he required a hypodermic injection of morphine. Almost every day thereafter the patient had a repetition of the colic, and the pain radi-

ated* to the back and left shoulder. On March 16, 1920, the patient entered the hospital.

On March 16, 1920, the physical examination showed the chest to be in good condition; the heart sounds were normal, and the heart was not enlarged. Palpation of the abdomen showed an area tender to pressure below the right costal margin. The stomach was not dilated and the liver was not markedly swollen. On March 17, 1920, an examination of the gastric contents an hour after a test breakfast showed: hydrochloric acid +; acidity, 50; no blood. The duodenal bucket showed no signs of ulceration and a permeable pylorus. The duodenal contents obtained on March 20th, in the fasting condition, revealed a dark brown colored fluid of great turbidity, alkalinity, 40; the ferments all present; $A = 7$; $S = 2$; $T = 6$; microscopically numerous small cholesterin crystals and pus corpuscles were found. Blood, hemoglobin, 80 per cent.; red blood cells, 4,800,000; white blood cells, 11,000; polynuclears, 60 per cent.; lymphocytes, 40 per cent.

A diagnosis of severe cholecystitis with probable stones in the gallbladder was made. An x ray examination confirmed this diagnosis. It showed a large shadow. The patient was then operated upon by Dr. J. F. Erdmann on March 25th. The gallbladder was found enlarged, filled with a mucopurulent fluid containing no bile. The cysticus was dilated and contained a stone the size of a half walnut, hermetically closing up this branch of the bile duct. The gallbladder itself was almost as large as a goose egg, distended with fluid and ready to burst.

CASE II.—C. A., aged forty-two years (January 6, 1920). Patient complained for the last six months of pain over the right hypochondrium, which was most severe after midnight. At times vomiting of bile occurred in the morning. Patient did not partake of alcohol and smoked moderately. He did not chew tobacco, slept well, appetite was good, bowels were always regular. The present trouble began eighteen years ago and was characterized by attacks of acute indigestion, pain over epigastrium, nausea and vomiting, unaccompanied by chills or fever. The attacks used to occur about three times a year, irrespective of the food taken. This condition assumed greater proportions for the past year, the attacks coming on more frequently each week and with greater severity. For the last four months the attacks appeared daily, the pain was more intense and lasted longer. The patient scarcely ever had chills or fever; vomiting occurred frequently. The vomitus consisted principally of bilious matter. The pain was getting worse, especially after midnight. For the last three months the patient would wake up during the night with pain. He would get up during the night, go to the cellar and chop wood. This gave him partial relief. The ingestion of milk would frequently allay the pain somewhat, but not when it was intense. The patient had lost over twenty pounds in weight. An x ray examination showed a deformity of the cap, but nothing abnormal otherwise.

When the patient consulted me on January 6, 1920, he was in great pain. The examination showed the following: The stomach was not enlarged;

the liver was swollen; right hypochondrium painful to pressure, with slight muscular rigidity. The duodenal bucket string test revealed a permeable pylorus and no distinct ulceration in the stomach or duodenum. The duodenal tube aspiration in the fasting state furnished a turbid dark green yellow bile; alkalinity, 25; $A = 7$; $S = 0$; $T = 0$. The blood showed 21,000 white blood cells. While in the hospital the patient was seized with a violent attack of pain in the region of the liver and had a rise of temperature (102° F.).

Notwithstanding the x ray findings of duodenal ulcer, a diagnosis of severe cholecystitis with probable stones and empyema of the gallbladder was made. The patient was operated upon by Dr. Willy Meyer. The gallbladder was found to be almost the size of a fist, greatly thickened, filled with a mucopurulent fluid without bile; toward the cystic duct two stones the size of a pigeon egg were lodged (Fig. 1).

CASE III.—March 14, 1920. Mrs. I. E., aged thirty-four years, had always enjoyed good health except that for the last eight years she had been troubled from time to time with rheumatism. Three years ago the patient began to suffer from attacks of severe pain in the upper abdomen, radiating to the back and right shoulder. The attacks would come on first about once a month, later especially during the last six months, every two weeks. The attacks varied in severity and duration. Some of them were relieved by hot applications, others required a hypodermic injection of morphine; some of the at-

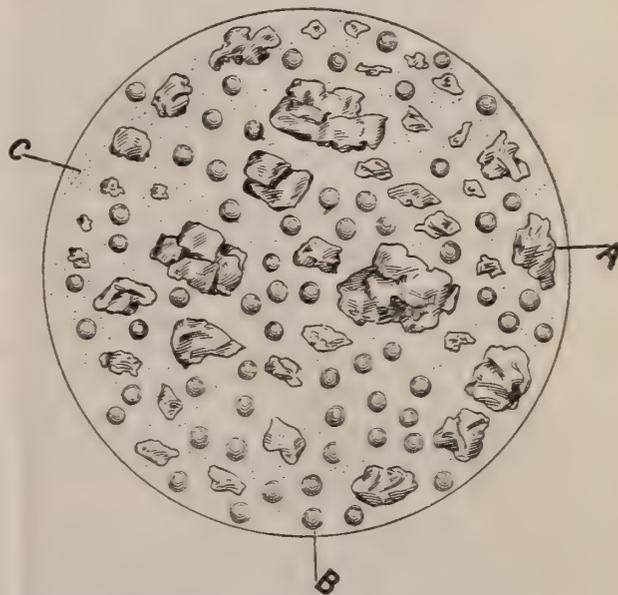


FIG. 2.—Microscopic picture of the duodenal contents (bile) of Mrs. E. A, big cholesterin crystals; B, pus corpuscles; C, mucus.

tacks lasted half an hour, others twenty-four hours. The attacks had no relation to the intake of food; nor were they relieved by food or alkalies. For the last year the patient complained of having attacks of sour stomach, belching, poor appetite, and constipation during the intervals. She frequently had headaches, and suffered from nervousness, dizziness

and spots before her eyes. She had lost about ten pounds in weight.

A few months ago an x ray examination had been made of her gastrointestinal tract. This showed a six to eight hour food retention in the stomach and a deformity of the cap. The diagnosis of the röntgenologist was pyloric obstruction due to duodenal ulcer.

The examinations performed at the hospital showed: The chest organs apparently normal. Abdomen: Stomach markedly dilated, the greater curvature was a hand's width below the navel. Palpation showed a painful area beneath the liver under the right costal margin. The gastric contents revealed: no hydrochloric acid; acidity, 6; no rennet present, no blood. Lavage in the fasting condition of patient furnished water without any traces of food. The duodenal bucket string test showed a permeable pylorus and no signs of ulceration. (Bile at nineteen inches, no blood stains.) The duodenal aspiration in the fasting condition revealed a yellow slightly turbid bile; alkalinity, 25; A=8; S=8; T=4; microscopically many cholesterol crystals; pus corpuscles and mucus. Two blood examinations were made; one on March 18, 1920, showed white blood cells, 6,000; polynuclears, 59 per cent.; lymphocytes, 41 per cent., during the interval. The other on April 5, 1920, during the attack showed

gallbladder was resected. Nothing abnormal was found in the stomach or duodenum.

A microscopic examination of a tiny piece scratched from the surface of the stone showed the same type of cholesterol crystals found in the duodenal contents before the operation. (Figs. 2 and 3.)

In Case I the diagnosis had been made of angina pectoris and auricular fibrillation. The direct examination showed a distinct pathological gallbladder condition and led to a correct diagnosis.

In Case II duodenal ulcer appeared to be the disease in question at first, the deformity of the cap revealed by the x ray likewise pointing to this. The examination of the bile, again, revealed gallbladder disease, while the string test negatived the presence of a duodenal ulcer.

In Case III the symptoms were definite enough to make a diagnosis of gallstone colic. The x ray indicated another disease. The duodenal bucket string test and the aspirated bile, however, led to a correct diagnosis, which found full corroboration at the operation.

The more detailed diagnosis will always have to be made by a combination of all the findings (subjective and objective) present. Thus, turbid bile, fever, extensive leucocytosis, high polynuclear count, considerable tenderness in the right hypochondrium, in conjunction with muscular rigidity on the right side, will point toward empyema or ulceration of the gallbladder nearing perforation. Severe colicky pains in the right hypochondrium, with or without a slight rise of temperature, followed a few hours later by perfect remissions and freedom from pain, will speak for a biliary calculus. Turbid bile will substantiate the diagnosis. The same symptom complex, with jaundice and absence of bile in the duodenum, will indicate a stone in the choledochus or common duct. Intractable jaundice, cachexia, frequent distress, but no sharp colicky pains, preceding the icterus, no bile in the duodenum or presence at times of clear bile, indicate a malignant disease involving the choledochus, or the hepatic ducts.

The treatment of gallbladder diseases can be divided into that of the acute conditions, and that covering chronic states. In both groups medical as well as surgical therapy have their special fields.

TREATMENT.

In acute cholecystitis, with or without stones, the former covering all colics due to biliary calculi, treatment consists of absolute rest, hot applications and the administration of an opiate. A hypodermic injection of morphine with or without atropine, a suppository of opium and belladonna, or the latter with codeine, will be beneficial. Hot drinks of plain water, or camomile tea are useful. Irrigation of the bowel with warm saline and the addition of essence of peppermint (one teaspoonful to a quart), especially when there has been no defecation for a day or two—is likewise beneficial. Usually the acute attack subsides in from one to three days, and there is either a return to the normal or, more frequently, to a kind of a quiescent or latent stage. Acute cholecystitis of great toxicity, giving rise to

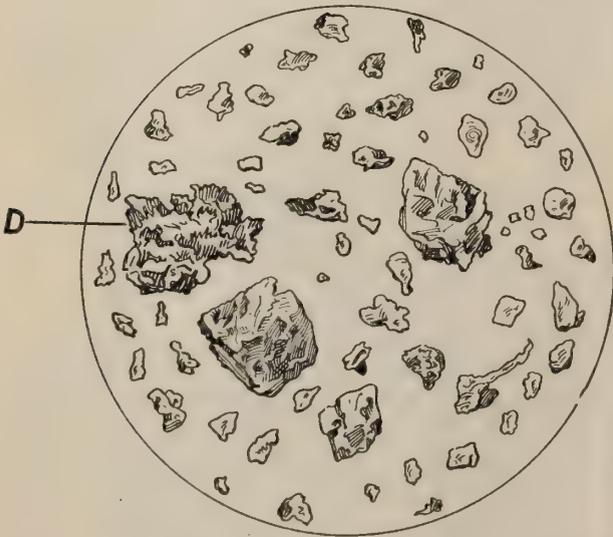


FIG. 3.—Microscopic picture of the scrapings of Mrs. E.'s gallstone, after removal by operation. The same cholesterol crystals are noted as found in the duodenal contents; D, chunk of calcium bilirubin crystals.

white blood cells, 10,000; polynuclears, 66 per cent.; lymphocytes, 34 per cent. A diagnosis of severe cholecystitis, probably due to a biliary calculus, was made and an operation on account of the frequency and severity of the attacks was advised.

Dr. Willy Meyer operated upon the patient on April 7, 1920. The gallbladder was found considerably enlarged (the size of a goose egg), its walls thickened; the mucosa in parts corroded and almost necrotic; toward the cysticus a large stone (the size of a walnut, was embedded; the contents presented a mucous fluid without bile but contained pus. The

emphyema, ulceration or a perforation of the gallbladder, requires immediate surgical intervention. Until the operation is performed applications of ice over the right hypochondrium, the administration of opiates, absolute rest, and very little liquid food form the principal methods of treatment.

The treatment of recurring cholecystitis, with or without stones during the latent stage, has two objects, 1, to reduce stagnation of bile, and 2, to combat the infection. The former is accomplished by drinking large quantities of water. Cures at Carlsbad, Kissingen, Vichy, Saratoga or French Lick Springs combine the advantages of water, mild aperients, and restful surroundings, which are of benefit for establishing a healthy liver function. Frequent and small meals of wholesome food (mixed diet, with plenty of green vegetables and fruits) are likewise of much assistance in increasing the flow of bile. The infection is best combatted by urotropine, salicylic acid, salol, aspirin, and again by flushing the gastrointestinal tract with great quantities of water. I found that glycerin given in teaspoonful doses, three times daily, exerts an antiputrefactive action on the bile. Patients who have been given this medicine furnish a bile that can be kept from one to two days without decomposition, while otherwise, the duodenal secretion after being exposed for a few hours in the air begins to smell badly and in about six hours develops a putrid odor.

This led me to prescribe the following medication which I frequently give in these cases with advantage:

Natr. bicarbon.	3ii
Glycer. pur.	3ii
Aq. dist.	3v
S. ̄ss. t. i. d., one half hour a. c..	

Antiseptic and astringent solutions can likewise be instilled directly into the duodenum, in order to exert a beneficial influence in this locality, which also has an effect on the biliary passages. Ichthylol (one half to one per cent.) or argyrol in the same strength (blood temperature) can be thrown into the beginning of the duodenum in amounts of from ten to twenty c. c. daily or every other day while the patient is in a fasting condition.

When biliary calculi are known to exist and give rise to difficulties through their migrations, olive oil administered in four to five ounce doses once or twice daily, has been believed to have a good influence on the passage of the stones. This can only refer to small calculi; but even then, the effect of the oil is problematical. Its action, however, is never harmful, and it can therefore be employed in appropriate cases.

The indications for surgery in chronic cholecystitis (with or without stones) are as follows:

1. Comparatively severe recurrent attacks of cholecystitis, whether accompanied by fever or not, require surgical aid.

2. Mild attacks of recurrent cholecystitis accompanied by a moderate leucocytosis (especially with an increase of the polynuclear cells) likewise require operation.

3. Chronic jaundice due to obstruction is best handled by operative measures.

4. Gallbladder affections in which there is sufficient reason to suspect a malignant disease should be operated upon as soon as possible.

Contraindications to operative measures are found in severe heart or kidney lesions, diabetes mellitus, general debility and old age. What to do under these circumstances (whether to operate or not) will depend upon the severity of the gallbladder affection and the degree of involvement of other organs. No hard and fast rules can be laid down. A careful consideration of the danger of the operation, and the benefit to be obtained by it, will make a decision possible.

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20 EAST SIXTY-THIRD STREET.

GASTRIC SUPERACIDITY.

Causation and Treatment.

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Gastric superacidity, because of its great prevalence, the distress or pain it causes, and its tendency to progress from mild to severe forms, is a subject worthy of continued study as to its causation and treatment. In this paper the various forms of gastric superacidity will be considered as a group. This includes hyperchlorhydria, in which the gastric juice is too rich in acid; digestive hyperchylia (1), or hypersecretion, in which the gastric secretion is excessive in amount, and usually too rich in hydrochloric acid; also, paroxysmal hyperchylia and chronic hyperchylia (gastrosuccorria of Reichman) (2) in which there is a continuous gastric secretion, even when the stomach does not contain food. These conditions, intermittent or constant, may be functional or the expression of organic disease. The milder forms are likely to progress to the severe ones. Their continuance may culminate in gastritis, the production of gastric or duodenal ulcer, or marked disturbance of intestinal digestion.

FREQUENCY.

Einhorn (3), in a series of 564 cases, found that 286 had an acidity of sixty or over, an hour after the test breakfast. I have just compiled a continuous alphabetical series of 300 cases, in which the test breakfast was used—152 of these showed a total acidity over sixty; eighty-seven over seventy; and thirty-eight over eighty. It may safely be concluded then, that about half the private patients complaining of indigestion, presenting themselves for treatment in New York, have an excess of gastric acidity, if sixty is regarded as the normal limit.

The methods which I usually use in arriving at a diagnosis of gastric superacidity are:

1. The Ewald-Boas test breakfast. One roll, or two slices of bread (about seventy gm.) and one and a half glasses of water (350 c. c.) are given in the morning when the stomach is empty, and expressed, or preferably aspirated, with a bulb specially adapted by me, an hour after the beginning of the meal (Fig. 1). When the aspiration is done, one or two bulbs of air are injected into the stomach to smooth out the rugæ before the gentle suction is employed. After a portion of the contents is aspirated, the funnel is connected, and 200 c. c. of water thoroughly mixed with the remaining contents, and withdrawn. This permits the determination of the total quantity of contents. (Method of Mathieu and Rémond, or more properly Jaworski) (4).

2. Duration test. Two soft boiled eggs, seventy gm. bread with butter, and a glass of water, are



FIG. 1.—Dr. Hayes's aspirating bulb with bevelled glass tip.

given in the morning. Three and a half hours later the stomach, which should be empty, is tested as in the case of the Ewald-Boas breakfast. If for any reason the tube is not used at this time, splashing or gurgling are noted, and two gm. sodium bicarbonate in a half glass of water is given. A notable increase in gastric tympany points to high acidity.

3. The introduction of the tube into the fasting stomach, to ascertain if there is continuous secretion of food retention. The undiluted and diluted contents, when present, are obtained and the determinations made as before. Thus the acidity is determined in the early stage of digestion—again at a time when after stronger stimulation the digestion should be completed; and with the fasting stomach—the three periods of special importance for diagnosis. Incidentally, these tests give valuable information as to the motor function.

ETIOLOGY.

The gastric secretion is affected through the nerves by mental states, nervous diseases, and by reflexes from points of irritation, especially if located in the abdomen, and of these particularly by disturbance in the gastrointestinal tract itself, or the organs directly connected with it. The secretion is also directly influenced by the chemical stimulation of certain food elements and acid acting on the pyloric mucous membrane, through the formation of a hormone (5), "which acts as a chemical messenger to all parts of the stomach, being absorbed into the blood and thence exciting the activity of the various

secreting cells in the gastric glands." The amount and quality of the gastric juice is also affected by the motor function of the stomach. For example: Food held back in the stomach, owing to spasm or obstruction, may cause an abnormal increase in secretion. The endocrine balance and other factors also have a bearing upon it.

The following, therefore, may be mentioned among the common causes of gastric superacidity:

1. Continued mental strain, vexation and disturbing care, have long been held by leading clinicians to be important etiological factors. This is doubtless true, despite the fact that the immediate effect of these emotions in animals (6) and man is to diminish the secretory and motor activity of the stomach. The overworked student, the worried broker, and the sensitive householder who cannot make ends meet, are ready victims of superacidity. With the present world wide conditions, promoting apprehension and mental distress, it will be strange if there is not a notable increase in the type of disease we are considering.

2. Gastric or duodenal ulcer, cholecystitis, cholelithiasis and chronic appendicitis, appear to cause supersecretion, by disturbing the vagosympathetic balance, inducing pyloric spasm. Troublesome hemorrhoids may act in the same way. When these conditions are painful, there is also a mental element in aggravating the difficulty.

3. Rogers (7) and his coworkers have shown that the subcutaneous administration of adrenal extracts, particularly the adrenal nucleoproteids, diminishes the secretion of the gastric juice, presumably by stimulating the sympathetic, or inhibiting nerves, and that extracts of the pituitary gland have a similar action but less intense; whereas certain thyroid, parathyroid, thymus, spleen, liver and pancreas extracts increase the gastric secretion, apparently through the vagi, or activating nerves. Rehfuss (8) reports two cases of total achylia in which the administration of parathyroid was partly responsible for a definite increase in secretion. We may, therefore, infer, that any condition in the body disturbing the balance of these important internal secretions will markedly influence the gastric secretion.

4. Unsuitable food and drink; excess of nitrogenous food; thermal, mechanical, or chemical irritants, as very hot and very cold drinks, coarse foods which are not or cannot be properly masticated; alcoholic beverages, strong tea and coffee; highly seasoned foods, and excess of sugar may induce superacidity. It is said that "in the United States the consumption of sugar per capita a year has gradually increased from eighteen to over eighty pounds in the past fifty years." May this not be a potent factor in causing such widespread superacidity?

5. Partial obstruction of the passage of food through any portion of the gastroenteric tract, with the associated reflex irritation and toxemia, is probably responsible for a large group of overacid conditions. There may be adhesions or bands between gallbladder and pylorus, duodenum or colon; dense bands at the duodenojejunal junction, or Lane kinks in the ileum; or bands compressing the colon or dragging it out of position. Ptosis of the stomach

or transverse colon, or a too free movement of the cecum, permitting sagging and torsion, may bring about the same result.

Lockwood (9) states: "As a clinical fact, whenever food exit is delayed, hyperacidity appears, and the more careful is our examination of patients with hyperacidity, the larger is the number of gastric atonies and motor errors of insufficiency that are discovered." Any condition resulting in considerable delay in the passage of food through the small intestine, I believe tends to induce gastric superacidity in an undamaged stomach. Associated toxemia is no doubt an important contributory factor. Pelvic diseases in women patients should not be overlooked.

TREATMENT.

Gastric superacidity, if at all prolonged, should be regarded with suspicion, and be given the careful treatment it deserves. The tendency, as previously stated, is for the mild conditions to develop into the more severe forms, and a neglected hyperchlorhydria may in time bring on a gastric or duodenal ulcer. It is important to differentiate between the functional cases and those due to organic disease, in planning the mode of treatment, and at times it is extremely difficult to do this; for example, with obscure adhesions, or a latent chronic appendicitis. Fenwick (10) believes that continuous secretion invariably indicates organic trouble (gastric or duodenal ulcer, gallstones or chronic appendicitis). Whether or not this is true, there can be no doubt that with cases of this type, painstaking and persistent search should be made for structural disease. Usually, if all the means at our disposal including the x ray are employed, the diagnosis can be made, and the treatment planned accordingly. As in other branches of medicine, it is important to correct, if possible, the cause of the disturbance. If there is a serious organic difficulty, gallstones, ulcer too severe or deep-seated for medical cure, pyloric carcinoma (an occasional cause of superacidity), bad displacement, or other mechanical conditions not controlled by suitable support of the abdomen, or other remedial measures, surgery is clearly indicated. For the borderline cases, marked hyperchylia, intermittent or chronic, including continuous secretion, medical treatment should be given a fair trial. For the milder cases, the treatment, of course, should be medical.

It must be made clear to the patient at the outset that these conditions are slow in developing, and that it will take persistence and honest cooperation on his part to effect a cure. The essentials in bringing about and holding improvement, are the maintenance of a right state of mind—calm, cheerful, and hopeful; the taking of a correct diet, at the right times and in the right way, and living in a physiological manner in the matter of suitable exercise, sleep, bathing, and dress. It is a matter of common experience that these patients are often relieved by a change of scene and occupation, only to have their symptoms recur on resuming their work, with its attendant cares. At times they recur with added force because of indiscretions in diet while the patient was away. Therefore, the treat-

ment should first be well started, and the patient intelligent and conscientious in carrying out instructions, if much benefit is to be derived from travel.

DIETETIC MANAGEMENT.

The diet must be prescribed for each patient. A theoretically correct diet is given, and this is then modified according to special indications, the response to treatment and the progress toward normal digestion, particular effort being made to reduce acidity, maintain comfort, prevent flatulence, and keep the urine indican free.

All food should be masticated to a fine pulp. For patients who cannot or will not chew thoroughly the food must, in preparation, be finely subdivided. Even then it must be eaten slowly so as to be well insalivated. It is most important that the teeth be free from caries and abscesses, and be put in the best possible condition. The omission of this may be responsible for failure to improve. While it is essential to give food of the right quality, proteids, carbohydrates, fats, salts, and vitamins, in such amounts as to meet the nutritional needs of the patient, an effort is made to avoid irritants in the diet, whether chemical, mechanical or thermal; consequently, mustard, pepper, horseradish, radishes, vinegar, sour tomatoes, strawberries, meat extractives, strong tea, strong coffee, or concentrated sweets are forbidden or greatly restricted. Vegetables with coarse, firm texture, seeds of grapes and berries, skins of fruit or potato skins, fall in the group of mechanical irritants, and while Pavlov (11) has shown that mechanical stimulation of a healthy dog's stomach does not directly stimulate secretion, there can be no reasonable doubt that at least indirectly coarse foods aggravate the troubles which are being considered. Under thermal irritants are included very hot and very cold drinks, and ices if taken rapidly.

Foods should be chosen which do not remain long in the stomach. Usually three meals are given, at five to six hour intervals; though it is sometimes better to arrange at first for three moderate meals, made up chiefly of milk, cream, whites of eggs, cereals, dried toasted bread and butter, at eight, one and six-thirty, and then give a cup of malted milk, weak cocoa or plain milk at eleven, four and bedtime. I agree with Bassler (12) that if a high proteid diet is employed, it should only be as a temporary expedient, to be gradually diminished to a normal percentage as soon as the comfort of the patient permits it. Beginning with a simple diet, the bill of fare may be gradually advanced to include most of the articles in the following list:

Egg albumen, raw or lightly cooked; milk, plain if slowly sipped, or made into soups with vegetable flavoring; plain junket eaten with cream and a little sugar; weak cocoa, or digestible cocoa, made with milk; malted milk, and similar preparations added to milk.

Fine wheat cereals and rice well done; these may be cooked in water or may be given in milk. Fine hominy, oatmeal, cornmeal, macaroni or spaghetti, very thoroughly cooked, may be used in suitable cases. Bread is best given dried and toasted. The addition of raw whites of eggs to the cereals is fre-

quently advantageous. Sugar should be taken sparingly; salt very moderately.

Cream, good butter (without butyric odor), and a little olive oil are the most suitable fats. Yolks of eggs are rich in fats, but should be used sparingly as they often cause distress. Fats, while somewhat diminishing acidity, tend to prolong digestion, and consequently must be given with some caution. Moreover, there is no advantage in giving fats so freely that they disturb the intestinal digestion, and pass off in large quantities by rectum.

Tender flesh foods; preferably white meat fish, chicken and lamb with extractives diminished by boiling, are generally the best foods of this type. As the patient improves, these may be given roasted or broiled, and to enlarge the bill of fare, beef, freed from fibre, or roast beef or steak. Tender fresh vegetables, such as string beans, peas, celery, spinach, summer squash, tips of asparagus, and sometimes young carrots well stewed, may be given to patients who can and will masticate thoroughly; otherwise, they should be made into purees or cream soups. Potatoes, mashed, baked, or twice baked, are allowed when flatulence is slight. Simple cereal puddings; rice, sago, tapioca, if well cooked, or custard made with milk, whites of eggs and about half the amount of egg yolks usually employed; and vanilla ice cream, made with comparatively little sugar (to be eaten very slowly), are types of suitable desserts.

Stewed fruits (sweet prunes, peaches, Bartlett pears), the pulp of a sweet orange, or sometimes half a grapefruit (if eaten very slowly) may be eaten to finish the meal.

MEDICATION.

Alkalies are surprisingly helpful as a rule in increasing comfort, and render important service in this way and by protecting the mucous membrane from the irritating action of a highly acid gastric juice. Unfortunately, in some cases they seem to heighten the activity of the gastric glands, so that after weeks of alkaline medication the test meal may show distinctly higher figures. Five grains each of bismuth subnitrate, heavy oxide of magnesia and sodium bicarbonate, stirred into a glass of water, may be given two or three hours after meals, or about fifteen minutes before the disagreeable symptoms usually appear, and be repeated if necessary. From one quarter to one half a teaspoonful of a mixture of equal parts of sodium bicarbonate and sodium citrate are employed in the same manner. Magnesia is valuable as an antacid and laxative, but may cause intestinal irritation if used too freely, or for a long time. Precipitated calcium carbonate may be substituted for the magnesia if the bowels are too active. Bismuth subnitrate given in dram doses, in water, an hour before breakfast, is very helpful; possibly in part from a mechanically protective action.

Adrenal nucleoproteid (13) and adrenal extract (14) seem to be of distinct value in some cases; but my experience with these is still too limited to draw definite conclusions. Belladonna, one to five minims of the tincture before meals, often definitely diminishes distress; apparently from its sedative ac-

tion, reducing the tendency to pyloric spasm. Strontium bromide, in five to ten grain doses, is sometimes helpful for a short time. Taka diastase, five grains, given during the first half of each meal, is often highly useful in aiding the action of the saliva, before it is checked by the acid secretion, resulting in better digestion and greatly diminished gas formation. Opium and its derivatives should rarely be employed, and then only in the severe attacks for a very brief period.

If there is associated constipation, the patient is taught to massage his abdomen, and only the blandest laxatives should be prescribed, such as purified petrolatum or liquid petrolatum (heavy), a half to one ounce at bedtime. Agar, finely flaked, plain or medicated with cascara, phenolphthalein or rhubarb, one or two teaspoonfuls, softened in water, after meals. Calcined magnesia, ten to twenty grains, stirred in water, at bedtime; compound licorice water, one or two drams, at bedtime; or fluid extract of cascara, freed from the bitter principle, a half dram at bedtime. Small doses of calomel are occasionally prescribed, or if need be, a dose of castor oil. Enemata or colonic flushing may be advantageous. If, owing to dietetic indiscretion, or unknown cause, there is marked nausea, pain and vomiting, the stomach should be emptied by tube if necessary, the bowels cleansed by enema, and one pint of water containing glucose, a half ounce, and sodium bicarbonate, a half dram, given by rectum, Murphy drip method, two or three times daily; no food by stomach for a day or two; then albumen water; later milk and bland soft diet. A warm compress over the stomach may also be employed with advantage. Lavage is not necessary in the mild cases. With marked hyperchylia (gastrosuccorrea), benefit is derived from washing the stomach with a one per cent. sodium bicarbonate solution, or with plain warm water, followed by a one to two thousandths solution of nitrate of silver (14), or a nitrate of silver spray (method of Einhorn) (15). Effective abdominal support is essential for patients with ptosis. This is given by means of a spring supporter, belt or corset, as is most suitable for the patient.

In conclusion, I may say regarding the entire subject of gastric superacidity that although the methods described are fairly satisfactory, there is need for continued research and experimentation, in order that the treatment may be established on more scientific lines.

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722 PARK AVENUE.

PRIMARY SACOMA OF THE STOMACH.*

Report of a Successfully Operated Case.

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The subject of primary sarcoma of the stomach is of far greater clinical importance than is generally assumed. A careful study of the literature shows it to be of more frequent occurrence than individual experience would lead one to infer.

Relatively speaking, gastric sarcoma has more often been the subject of mistaken diagnosis than perhaps any other gastric condition. In many instances the clinical and operative diagnosis has been in doubt until cleared up by the ultimate histological examination. In such cases the presumptive diagnosis has almost invariably been cancer. Gastric sarcoma has, however, been mistaken also for many other intragastric and extragastric conditions, e. g., neoplasms of the spleen, tuberculous abdominal glands, abscess of the liver, suppurative peritonitis, pancreatic growths, benign peptic ulcer with secondary infiltrating tumor, and many other conditions.

The character of this neoplasm varies so widely in the different varieties, from extreme malignancy down to almost certain promise of radical cure, that attention to the possibility of its occurrence, as well as to its early diagnosis, are matters of the utmost importance. In numerous instances the diagnosis has been made so late in the course of the disease that operative interference was tantamount to an antemortem procedure. Where, however, early operation was undertaken, radical cure, or at least freedom from recurrence for a number of years, has frequently been obtained. It has been my fortune to have encountered such an early case, and I present it herewith in the hope of stimulating interest in this comparatively rare disease, and also of evoking an active discussion of the various phases of the subject.

CASE I.—The patient, C. C., aged twenty-two years, dressmaker, was first seen by me on January 1, 1919, in consultation with Dr. Joshua Leiner. The family history, aside from the death of her

father from gastric carcinoma, was negative. The patient herself, though a moderate eater and somewhat constipated, had always been stout and enjoyed excellent health. She dated her present illness back to about one year before, when, following a dietary error, she suffered from what she termed an attack of acute indigestion. A laxative was followed by temporary relief for about three weeks, when she began to experience frequent attacks of sharp cutting pains in the right hypochondrium and anterior lumbar regions. These began several hours after meals and lasted three or four hours each time. They were associated with heartburn and frequent belching of sour or tasteless gases. The distress was so acute that relief was sought through forced vomiting. The amounts vomited, especially of late, exceeded those ingested, although food from previous days was never noted. Meat and other heavy foods increased the pains, while fluids often gave relief. The pains, vomiting and other manifestations, had markedly increased during the past three or four months, during which period, too, there had also been a loss of about twenty-five pounds in weight. There was no history of fever, cough, sweats, hematemesis or melena.

Examination showed a thin, anemic, and rather feeble individual, without, however, any evidence of systemic or central nervous disease. The abdominal wall was thin, soft, and relaxed, and the abdomen therefore readily palpable. In the right hypochondriacal and lumbar regions, somewhat to the right of the usual duodenal area, a hard globular mass, about three inches in diameter, could be easily felt. It was smooth in outline, quite tender to the touch, and freely movable. It was especially well felt when the patient arched her back forward, thus stretching the anterior abdominal wall. Its density and firmness reminded one forcibly of indurated tuberculous abdominal glands.

The stomach was considerably enlarged to percussion, the greater curvature being two or three inches below the umbilicus. There was no visible peristalsis or gastric stiffening, no resistance, no other points of tenderness, or any other palpable masses. The free edge of the liver was felt about two inches below the costal margin. It was, however, normal to the touch. The spleen and left kidney could not be felt, though the right kidney was prolapsed to the second degree. It was not sensitive to the touch and apparently normal.

For the purposes of better observation and treatment, the patient was admitted to Lebanon Hospital on January 3rd. Temperature, pulse, and respiration were normal; the blood pressure averaged 105 systolic and 75 diastolic. Occasionally pains of moderate severity were felt in the right upper quadrant. She was placed upon a soft diet which was for the most part retained, although several times there were attacks of slight or even profuse vomiting, which, however, never was sanguineous, but always contained rather large amounts of mucus. The appetite was good. The Wassermann reaction was negative. Examination of both the urine and feces proved negative. Two string tests were attempted, but proved unsuccessful as the

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patient vomited each time. Retention tests were also vomited, but one or two successful ones showed evidences of partial pyloric obstruction, viz., a few ounces of stomach contents, containing some of the barley and meat from the previous evening meal, as well as a large number of sarcinæ. There was no gastrosuccorria. In the fasting state the free hydrochloric acid was ten and the total acidity sixty-four; after the Ewald-Boas test breakfast there was thirty free hydrochloric acid and eighty total acidity. Lactic acid was never present.

Diagnostic considerations.—It was seen that we were dealing with an indurated tumor mass located in the middle area of the right side of the abdomen; this mass was definitely circumscribed, easily palpable, freely movable, and rather tender to the touch. The tumor was causing a partial pyloric obstruction, pronounced abdominal pains, frequent attacks of vomiting and sitophobia, and was associated with a rapid loss in weight and strength. There was no evidence of gastrointestinal hemorrhage.

Two pertinent points of interest presented themselves for discussion, viz., the nature of the tumor and whether it was of intragastric or extragastric origin. Although the patient was examined by a number of careful and experienced observers, no positive conclusion as to the nature of the tumor was reached. Neither the clinical course nor the objective findings offered sufficiently acceptable criteria for an indisputable diagnosis. The history of the case and the presence of an indurated tumor were strongly indicative of a malignant growth, and, in an older individual, particularly with a longer history of gastric distress, the recent and rapidly progressive downward course, such a diagnosis would have been justified. But the age of the patient, the absence of free and of occult blood, the presence of sarcinæ and of a high degree of hydrochloric acid, were factors that spoke strongly against malignant disease, and favored rather the existence of a benign process. It was felt that we were dealing here most probably with a pyloric ulcer associated with pronounced inflammatory changes. Sarcoma was not even thought of. The tumor itself was freely movable; its situation was low for the pylorus, and the obstruction was only a partial and not a constant one. These facts led the greater number of observers therefore to favor the diagnosis of an extragastric lesion with inflammatory changes, resulting adhesions and partial obstruction to the pyloric outlet. Among the other diagnoses suggested were omental tumor, inflamed adherent gallbladder, tuberculous peritoneal glands, indurated inflammatory cyst, and even chronic appendicitis, situated unusually high. Discussion of the pros and cons for these various opinions is unnecessary.

The röntgenological examination pointed decidedly to an intragastric lesion. The report stated that the stomach was enormously enlarged, markedly poséd and atonic, with extremely sluggish peristalsis and a large residue after six and even after twenty-four hours. The duodenum was difficult to visualize, but the first portion and also the pyloric end of the stomach appeared decidedly pathological.

The röntgenological diagnosis was "gastrextasy with marked pyloric obstruction, evidently due to an organic lesion involving the pyloric end of the stomach and the first portion of the duodenum."

In view of all the facts mentioned above the case was regarded unquestionably as a surgical one. Operative interference was advised and consented to. The operation was performed by Dr. Henry Roth on January 12th, ten days after the patient's admission to the hospital. A median line upper abdominal incision was made. The stomach was found to be very large and dilated and freely movable. The duodenum, too, was freely movable, but apparently normal. In the pyloric portion of the stomach there was seen and felt a large indurated mass, occupying the greater portion of the antrum and extending down close to the pyloric ring. It was situated intramurally, the serous coat being intact. The tumor surface and outline were smooth, and while the mass strongly suggested an inflammatory infiltration, such as one so often finds associated with chronic ulcerative obstruction, Dr. Roth was decidedly of the opinion that it had the induration of a malignant process. Because of this fact, and also because of the sharply circumscribed area and free mobility of the tumor mass, a complete resection was decided upon. Thereupon, a typical Mayo cautery resection, which included the postpyloric portion of the duodenum and the stomach antrum just proximal to the tumor margin, was carried out. This procedure was followed by a typical posterior gastroenterostomy, done without the use of clamps. Careful exploration of the entire abdomen failed to show the presence of any other growth. The wound was closed in the usual manner, leaving a rubber tissue drain in the duodenal stump.

The postoperative course during the first two weeks was marked by fever ranging from 102° to 104° F., and a disturbed mental state (psychosis) manifesting itself through extreme loquaciousness, irritability, distrustfulness of attending nurses and doctors, and a fixed stare with failure to reply to direct inquiries. On the thirteenth day after operation there was a sudden profuse discharge of a purulent secretion from the wound, followed by a rapid drop in the temperature, and an improvement in the mental state¹. Thereafter recovery was progressive, and the patient was discharged from the hospital on the twentieth postoperative day. She has steadily improved, and now, five months after her operation, feels well and has gained over thirty pounds. In April, 1920, fifteen months after her operation, the patient was feeling very well and had gained fifty pounds in weight.

The gross appearance of the tumor has already been described. It was a rounded mass, three by five cm. in diameter, having a density exceeding somewhat that of a uterine fibroid. The sarcomatous portion was adjacent to the pylorus, while the rest of the mass was made up of dense inflammatory tissues.

The specimen was microscopically examined, and reported upon as follows by the hospital pathologist, Dr. E. P. Bernstein: The mucous membrane di-

¹ The rubber tissue drain had been removed rather early after the operation and this may have accounted for the retained exudate with the associated fever and the mental condition.

rectly over the main tumor mass is comparatively normal, showing only an occasional area of new growth cells between its ducts. The submucosa, which is the apparent origin of the growth, is almost completely replaced by tumor cells—either in masses or loosely distributed between strands of connective tissue. The cells are roughly polygonal in shape with a fairly large, well staining nucleus and surrounded by an abundant zone of clear cytoplasm. Some cells show active mitotic figures. The tumor cells bear no relationship to the blood vessels present. The muscularis is but sparsely invaded by tumor cells which are seen in the innermost portion of the circular layer, but not at all in the longitudinal layer. The serosa is normal. The microscopic picture presented is that of a malignant tumor (large round celled sarcoma) which has not progressed enough to invade more than the submucosa.

In this case as in so many others, practically all reported sarcomata of the stomach, the ultimate diagnosis was a surprise. Despite an increasing and ably discussed literature on the subject, this condition is still regarded as one of extreme rarity, so rare, indeed, that it is scarcely ever thought of when one is confronted with a possible case. Writer after writer has, however, emphasized the fact that sarcoma of the stomach is a much more frequently occurring affection than is generally assumed, and has urged that more histological examinations be made of hastily assumed carcinomata.

In view of this fact, and also of the circumstances mentioned in the opening remarks of this presentation, it is felt that a brief discussion of the main clinicopathological features will be of interest. Those desirous of obtaining further details of the subject will find them interestingly discussed in the writings of Schlesinger (3), Kundrat (4), Fenwick (5), Manges (6), Flebbe (7), Frazier (8), Warner (9), and others.

Sarcoma may be either a primary or a secondary growth of the stomach. Excepting in the case of the lymphosarcomata, the primary form is of more frequent occurrence.

FREQUENCY.

From reports of cases it is generally assumed that sarcomata of the stomach constitute from five per cent. to eight per cent. of primary malignant gastric neoplasms, and about twenty-five hundredths per cent. of sarcomata in general. [Mikulicz and Kausch (1) and (2).] These and all other statistical figures regarding this type of growth are relative only, since many cases of assumed cancer, or, on the other hand (as in the case now reported), of assumed chronic inflammatory infiltration, associated with chronic gastric ulcer, have, upon subsequent histological examination, proved to be sarcomata. Thus, Perry and Shaw (11), in going over the Guy's Hospital series, found that four out of fifty previously reported carcinomata were really round celled sarcomata.

FORM AND SIZE.

This growth may occur as small or large, nodular or diffuse, hard flat tumor masses within the wall of the stomach, or as polypoidshaped projections from the stomach wall either into its lumen or into the greater or lesser peritoneal cavity. The size

varies from a minute nodule to an enormous mass that may, as in Baldy's case (12), weigh fifteen pounds, and almost fill the entire abdominal cavity.

TISSUE ORIGIN AND TYPES.

Sarcomata being a nonepithelial type of growth, never originate from mucous membrane. They may, however, develop from connective tissue, smooth muscle fibre, lymphoid nodule, or from the endothelial cells of the lymph spaces of the stomach. According to their tissue origin they form respectively true fibrosarcomata, leiomyosarcomata (malignant leiomyoblastomata), lymphosarcomata (malignant lymphoblastomata, Hodgkin's disease) and endotheliomata. According to their cellular structure they are classified as small and large round celled and small and large spindle celled sarcomata.

The age of incidence varies widely. Thus, Findlayson (13) reports a case observed in a child three and a half years of age, while di Giacomina (14) reported one in a man aged ninety-one. Contrary to the accepted view regarding sarcomata in general, the age of greatest incidence appears to be, not that of younger individuals, but that between forty and fifty years (Corner and Fairbanks) (15). The connective tissue and lymphoid varieties occur especially in young individuals, while the smooth muscle type is seen more often after the age of thirty to fifty. While opinions differ, the majority of observers agree that the curvatures, especially the greater curvature, are the most frequent seat of origin.

COMPLICATIONS AND DEGENERATIONS

The complications and degenerations are numerous and are associated with the more advanced stages of the growth. They include ulceration, hemorrhage, deformity of stomach outline, obstructions, torsion, cystic and purulent changes, adhesions to neighboring parts and metastases. Metastases may be entirely absent or may occur in neighboring or distant organs, particularly the skin.

Symptoms.—Frequently there is an entire absence of gastric symptoms throughout the entire course, or at least until the growth is far advanced. This arises from the fact that the mucous membrane is not involved and that usually there are no obstructive changes. In many other cases the predominant manifestations are those due to the complications, or to secondary changes in the growth itself, and these have given rise to greatest errors in diagnosis.

The gastric symptoms vary from the mildest expressions of gastric dyspepsia to the severest manifestations of gastric cancer. No definite diagnostic signs and symptoms can be stated. In almost all instances of sarcoma of the stomach the correct diagnosis has never been made previous to direct exploration. In a few exceptions the diagnosis was ventured through the examination of tumor particles obtained from stomach contents, [Riegel (16), Westphalen (16), or through excision of a metastatic growth in the rectum, Schlesinger (17)], skin, glands, etc. That even this latter procedure may be misleading is emphasized by Leube (18), who instances a case of skin sarcomatosis occurring coincidentally with a true epithelial gas-

tric cancer. Dreyer (19), on the other hand, encountered a case of spindle celled pyloric tumor coincidental with a carcinomatous ulcer at the pylorus. The metastases in this case were carcinomatous. As long ago as 1902, Fenwick (20), in his well known monograph on gastric tumors, cites a number of points, attention to which he states makes possible the diagnosis of round celled sarcoma of the stomach. Despite a careful search of the accumulated literature since that date, I have failed to encounter a single instance in which a correct preoperative diagnosis has been reported, excepting through the examination of a metastatic growth, or an expelled tumor fragment.

In a diseased condition, therefore, such as the one under consideration, the occurrence of which, even in a most typical manner, has almost invariably baffled the diagnostic acumen of so many careful observers, it would be an idle task to venture to lay down definitely drawn lines for exact diagnosis. Until the discovery of a specific reaction the diagnosis will probably remain a matter of doubt. The one condition, after all, from which it is most desirable to differentiate sarcoma, is that of carcinoma of the stomach. The importance of this arises from the fact that sarcoma is, on the whole, a much more slowly growing tumor, and, in the relatively early cases, offers a far better chance for a radical cure. Both affections have many characteristics in common, such as the earmarks and accompaniments of malignancy, the alterations in gastric structure and functions, the occurrence of hemorrhages, metastases, splenic tumor, and febrile states. There are, however, some definite distinguishing features which may serve to guide us in clinical differentiation. Thus, carcinoma arises from the epithelium, and though it may involve the rest of the stomach wall, the mucous membrane is always also affected. Sarcoma, on the contrary, as already stated, arises from the nonepithelial tissues, and does not, as a rule, invade the mucous membrane. When it does injure the mucosa, it does so through mechanical force (pressure or erosion). Carcinomata, too, are most frequently located at the orifices and in the body of the stomach; sarcomata, along the curvatures. Hence, carcinomata are more likely to cause early pyloric obstruction. In most instances in sarcoma this is a late complication, and is due not so much to narrowing of the pyloric orifice, as to massive infiltration of the stomach walls. In many instances this massive infiltration causes, not an obstruction, but a gaping of the pylorus. Carcinoma is rapid in its growth and in its general systemic effect; sarcoma, on the contrary, shows quite the reverse characteristics, especially the leiomyosarcomata and the endotheliomata, which are very slow to metastasize. Hence, in carcinoma we more frequently find early local gastric symptoms and signs. Round celled sarcoma is, however, as a rule, a rapidly growing tumor, and, like carcinoma, very prone to metastases. Despite the fact that sarcoma frequently leaves the mucous membrane intact, a number of observers report diminished or absent hydrochloric acid, and even the presence of lactic acid and Boas-Oppler bacilli. Thus, Schlesinger

(17), in three cases, found free hydrochloric acid absent and lactic acid abundantly present; Mathieu found hydrochloric acid absent in eleven out of seventeen cases. Indeed, Harlow Brooks (21) reports that he found both lactic and hydrochloric acid present in his cases, and instanced this simultaneous presence of both kinds of acids as one of the signs that "should lead at least to the serious consideration of the possibility of gastric sarcoma."

Sarcomata being generally less malignant than carcinomata, we find that their average duration is longer than that of carcinomata. Two or three years' duration after the onset of symptoms is not rare.

Occult blood and hemorrhages are relatively less frequent in sarcoma than in carcinoma. Still, attention has been drawn by Manges (6) to a group of sarcomata in which hematemesis is the leading symptom. These, for the most part, were advanced cases. Splenic tumor and fever are more frequently encountered in sarcoma than in carcinoma.

Finally, the spindle celled sarcoma may progress to even quite an advanced stage without giving rise to any gastric symptoms. This applies more especially to pediculated subperitoneal cases that project beyond the body of the stomach, invading the greater or lesser peritoneal cavities.

PROGNOSIS.

The average duration of untreated round celled types is reported to be about fifteen months; that of the spindle celled twenty-four to thirty-two months, and that of the myosarcomata three and a half years. The lymphosarcomata have the greatest tendency to metastasize, and the endotheliomata the least. Naturally, the earlier the removal, the less danger is there of recurrence. Even the most prolific varieties, the lymphosarcomata and fibrosarcomata, give a better prognosis as regards recurrence after removal than do carcinomata.

TREATMENT.

This, of course, in cases not too far advanced, or even in those where the diagnosis is in doubt, or mechanical relief is indicated, should only be surgical. In inoperable cases a course of Coley's serum might be tried. In cases of lymphosarcoma, especially in the inflammatory or Hodgkin's type, arsenic therapy is decidedly indicated.

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- 40 WEST EIGHTY-EIGHTH STREET.

INFECTIONS OF THE GASTROINTESTINAL TRACT AND THEIR RELATION TO ARTERIOSCLEROSIS.*

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Arteriosclerosis, because of its frequency, its consequences and tendencies to cause complications, may justly be called the most important degeneration incident to physical ageing. If recognized early, it is comparatively easy to impress a patient with the possibilities of the situation without unduly frightening him and to institute a course of treatment which will materially benefit the condition as well as inhibit the insidious process in its development.

In this essay I shall present my own ideas of arteriosclerosis as well as my classification of the various types and phases of this disease. For the moment we will review the theories now current so that a contrast of ideas may be more apparent and that the reader may judge impartially of the conclusions reached by observers of this disease.

ETIOLOGY.

In Germany, Thoma's histomechanical theory finds favor, this view being founded upon the atonic muscular conception. His critics state that most cases of endarteritis or arterial degeneration due to faulty or deficient nutrition occur before the loss of muscle tone, as would be evidenced by vascular dilatation. In France and America the autointoxication theory of Metchnikoff is generally accepted. The circulating toxins are said to irritate or inflame the endothelial structures. Opponents of this theory cite that feeding animals upon sterile food soon produces death: that vegetarians suffer from arteriosclerosis and that the degree of arterial degeneration bears no proportional relation to the amount of meat ingested.

The endocrine enthusiasts believe that the burden of the mischief making rightfully belongs to a hyperadrenalism, the physiological excess of adrenal secretion producing a vasoconstrictor effect. Prohibitionists have not neglected the opportunity and insist that alcoholic beverages are the chief causes. The antibacco fanatic is equally as insistent as the prohibitionist that the weed deserves the honor. Other cranks include coffee, tea, and in fact everything that is likely to stimulate our senses pleasantly.

Weil has recently suggested a new theory; that is,

that there is a retention of the lime constituents due to some fault of kidney elimination. He conceives this to be a metabolic perversion akin to gouty diathesis. L. F. Bishop has advanced a very practical theory of arteriosclerosis. He calls the symptom complex, cardiovascular renal disease. He believes that the disease is primarily due to a disturbance of metabolism that has extended over a long period of time before manifesting itself. The metabolic perversion is traceable to bacterial invasion, chemical poisoning, food poisoning, psychic traumas or a combination of these factors. This metabolic disturbance results in a sensitization of the body cells to particular proteins ordinarily found in foods. The three kinds of food found most irritating to the sensitized cells are meat, fish and eggs. This conception is perhaps the broadest of all the theories advanced. It is purely clinical and the results obtained from therapy based upon this theory seem to establish, clinically at least, the logic of the deductions.

However, it seems best to consider arteriosclerosis as part of a general involutinal process occurring during the life cycle of the biological unit. It represents a normal evolutionary consequence, because of the structural complexity of the cellular arrangement not allowing of proper nutrition or adequate removal of waste products from the body cells.

Weissmann and others have shown that protoplasm is potentially immortal. Observing infusoria under a favorable environment which he had prepared for them, he noticed that they lived for generations without showing any tendency to degeneration or death. He proved that infusoria never died except as a result of an accident, improper or insufficient food, the improper removal of waste products or by the radical alteration of other vital environmental circumstances. From these deductions on infusorial life scientists began to inquire why the cells should lose their incapacity for potential immortality when aggregated into the making of a multicellular unit. The fact that infusoria degenerate or die when placed in unfavorable surroundings supported the idea that the multicellular organisms owed their degeneration and death to the development of unfavorable conditions within and without themselves rather than to an inherent propensity to die.

The human organism, like the infusoria, began life with the formation of a one cell organism which divided into two cells after being stimulated by the male sperm. Successive division into two, four, eight, sixteen, thirty-two, sixty-four, etc., occurred. Unlike the infusoria, each cell did not spread in all directions and take up an isolated, individual existence, but clustered together to form a larger and larger cell mass. Soon some of the cells assumed different shapes and clustered more compactly at different points to form the various specialized body structures; muscles, nerves, blood vessels, bones, and other structures, although they all originally sprung from a common source. However, regardless of the specialized functional characteristics which they may develop, they all retain the most primitive of cell functions, growth, nutri-

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tion, and reproduction. They all require food for their growth and for their reproduction, and all excrete waste products, the chemical ash, so to speak, of their growth, their nutrition, their productive and vital activities. Since the cells have clustered to form specialized organs with special functions, the problem of adequate nutrition and proper waste removal for each cell of these units became more complex than when each individual cell established an isolated existence after the fashion of the infusorial cells.

The problem of getting rid of waste products and of getting the proper amount of nutrition to each component cell of a multitudinous aggregate, such as a fish, or a cow, or a human, was facilitated by an evolutionary urge which established channels through which nourishment could be distributed to isolated cells and through which channels these waste products could be removed. These tubular structures are the gastrointestinal tract, the blood vessels, the lacteals, the lymphatics, the bronchial tubes, the kidneys, and the skin glands. These channels either supply nourishment or remove waste products or do both. As long as the food supply is properly balanced and the waste removal adequate, good health should prevail, assuming that each component cell is treated alike in a multicellular organism. However, in the multicellular organism, no matter how well the unit is supplied with channels for transporting nutrition and for removing waste products, there are numbers of cells that cannot be reached directly by these channels. For this reason, there is a constant amount of cellular death of isolated cells which is taking place within our body and which is being replaced by the proliferation of adjacent cells more fortunate than its neighbor, as regards nutrition and waste removal, to take the place of the dead cells.

In addition to these defects within the cellular arrangement, our chemical laboratory, the gastrointestinal tract, which prepares the nutrition for the body, as well as eliminating a very great proportion of the waste products of the body, has been imposed upon with a dietary, the cumulative product of the culinary fiendishness of generations of crabbed cooks and irrational chefs, as well as the gourmandizing demands of gastronomic perverts, for which it was never intended to deal.

Modern dietary fuel is so rankly well cooked, so rottenly pleasant to the taste, so poisonously laden with highly putrescent protein, and so viciously full of harmful bacterial and noxious parasites, that it simply blocks the sewerage, if you please, and there results a baneful organic reflex—disease. When this occurs intestinal stasis is brought about and the chemical balance in the colon is lost because of the predominance of bacterial activity that produce putrefactive and butyric acid products. These predominate because the food residue of the average person is so rich in proteids, and is so excessive in quantity, that a fertile and inexhaustible amount of pabulum is furnished for the growth of the harmful bacteria. Because of a lack of starch or sugar residue the helpful fermentative bacteria are starved, decrease in num-

bers and, finally, are not capable of arresting the growth of the harmful bacteria as well as neutralizing the harmful products which they elaborate during their functional cycle. When this occurs, the intestinal functions become impaired, and as a result the food molecules are inadequately or improperly broken up and are carried to the cells to be used in a raw state. The cells have to further digest the raw products for their use.

In the digestion of these raw products, chiefly protein derivatives, a sensitization occurs and later an unmistakable anaphylactic reaction is produced. Add to this the sensitization which is produced by the food toxins, the product of putrefaction, which are absorbed directly through the intestinal walls and into the circulation, as well as the migration of bacteria directly into the circulation and indirectly into the circulation through the lymphatics, and it requires but little intelligence to grasp the significant reaction that will occur in the body's effort to rid itself of a menace which is threatening to throttle its very existence.

Therefore, it seems logical to believe that cellular malfunction, cellular degeneration, cellular ageing, and cellular death are caused in a multicellular organism, such as a human being, by the following factors: 1, Improper dietary; 2, focal infection; 3, a chemical unbalance of gastrointestinal function; 4, intestinal stasis; 5, gastrointestinal infection.

The reaction of the cells of the body are as follows: 1, A sensitization to raw, nutritional products; bacterial toxins and the toxins generated in the colon because of a disturbance of the fermentative-putrefactive balance; 2, a resultant improper cellular digestion; 3, cellular anaphylaxis to foreign chemical substances; 4, a formation of waste residue in the cellular substance that is difficult of cellular elimination; 5, an irritation of the waste removal channels; 6, an inflammatory process involving the waste removal and the nutritional bearing channels; 7, a compensatory, protective, constructive degeneration of the waste removal channels and 8, cellular retention of toxic materials, the cumulative effect of which causes death.

These toxins, the product of microbic activity that are flourishing in the intestines, the oral cavity, the gallbladder, the glandular system and other tissues, during a crisis, somatic or psychical, correlate their energies, become kinetic and are rapidly diffused throughout the tissues, their clinical display comprising many clinical pictures in which the circulatory apparatus always bears the brunt of the attack as it is the channel through which these toxins, food poisons and cellular waste products course throughout the body. Therefore, arteriosclerosis is never due to one factor, not even excepting syphilis, but to a combination of factors, the mobilized toxic products of which produce the arteriosclerosis.

Nervous, mental and emotional stress, the end product of the complexities of the fast changing social order, has to be reckoned with. Psychic conflicts and maladjustments and their compensatory compromises are in a great measure absorbed by the phylogenetically oldest level, that is, the physiochemical level, and any one familiar with a neurology

based upon an evolutionary conception cannot fail to understand that psychic stress is capable of upsetting metabolic or endocrine harmonies. In the battle against this array of enemies and in attempting to intrench themselves the cells may be said to undergo a constructive or protective degeneration, thereby attempting to protect and preserve their function.

PATHOLOGY.

The pathology of all arteriosclerotic degenerations is essentially the same, differing one from the other in respect to etiology and the anatomical structures primarily involved. Three types are usually cited, known as the inflammatory type, the mechanical type, and the nutritional type. It is doubtful whether any one of these three types ever occurs alone.

In the inflammatory type the circulating toxins produce a local endothelial irritation and nature responds to this irritation by a protective hyperplasia of endothelial cells. Thus, endothelial patches are formed, a disturbance of the circulation in the vasa vasorum results and from lack of proper nutrition the patches undergo a granular or fatty degeneration. A thin membrane separates the patches from the circulating blood thus hindering the normal bathing of endothelial cells in blood plasma. Further degeneration of the patches forms a nodule filled with cholesterol debris and fatty deposits. The phenomenon is completed by the deposition of lime in this fatty mass, forming a fatty soap, and later by the formation of the insoluble carbonate and phosphate of lime by chemical action of acid radicals on this lime.

Arterial muscle, being a highly specialized tissue, soon breaks down after adequate vascularization is interfered with. Connective tissue hyperplasia is the constructive degeneration planned by nature, because it requires less blood supply and does fairly well substitute the action of arterial muscle. The degeneration may be incomplete or complete, depending upon the age of the process.

The mechanical type begins in the media with a loss of muscle tonicity, then a vascular dilatation occurs with compensatory tortuosity. The constant overstretching of the muscle of the arterial wall saps its tone. An intimal thickening results from a proliferation of the subendothelial layer. Disturbance of vasa vasorum circulation occurs with a resultant additional degeneration of muscle and of proliferated cellular elements. Lime deposits and the fatty masses then undergo the analogous chemical changes described under the inflammatory type.

The nutritional type differs in that proper nutrition is withdrawn and there is a resultant rapid muscular degeneration with the formation of minute atheromatous abscesses and aneurysmal sacs. Connective tissue replaces the muscle and elastic tissue.

On analyzing the preceding remarks concerning the pathology of arteriosclerotic degenerations we are impressed with the fact that there is much in common in all types. It appears that there is first an irritation factor at work, followed by a protective reaction on the part of the specialized tissues apparently to protect the most useful coat of the arterial wall, the muscle and elastic tissue, then a disturbance of vasa vasorum

circulation, followed by a degenerative process which forms connective tissue to replace a wasting muscle and elastic tissue. The connective tissue substitutes for the muscle.

Reasoning that arteriosclerotic changes are normal phases of an involitional process, it would appear that these changes when normal or abnormal are brought about by nature in a conservative attempt to protect the biological unit. Therefore, it appears within reason to consider arteriosclerotic changes compensatory and, therefore, to constitute a constructive degenerative process.

SYMPTOMS.

An attempt will be made to outline only the symptoms that are associated with early arteriosclerotic changes. Late symptoms are so manifestly indicative that diagnosis is practically possible by listening to the complaints alone. Degenerating blood vessels give rise to no early symptoms. Subjective symptoms and sensory disturbances may arouse our suspicion of organic disorder long before objective findings are demonstrable. There may be no relation of disease and symptom.

The earliest sign of arteriosclerosis is an increase in arterial tension. Bishop has called attention to exceptions of this rule, especially found in arteriosclerotics with neurasthenic states. Occasionally, the normal difference of pulse rate when standing and when in a recumbent position is not maintained. One may suspect an organic process if the rate standing is less than six over the pulse rate when reclining. Palpitation after eating, smoking or sudden exertion is common. Inability to lie on the left side without producing palpitation or cardiac discomfort is frequently found. Headache, especially on awakening or after smoking, is a symptom often associated with early sclerosis of the cerebral vessels. Muscular twitchings; muscular cramps nocturnal and after exercise; tremors of the face, tongue and fingers; tinnitus; dizziness; diplopia; blurring of vision; gastric and abdominal distress, as flatulence, meteorism, constipation with alternating diarrhea are significant in a patient of forty or over.

Sensory disturbances, such as flushings, formications, numbness and tingling, head pressures and fainting sensations, are common. Nervous disturbances, such as irritability, intolerance of others, lack of vital interest, depression and phobias often manifest themselves. Insomnia is a distressing symptom at times.

DIAGNOSIS.

A careful study of the individual's symptoms and an attempt to explain their source rationally will justify repeated and thorough observations. Perhaps the earliest physical sign is a hypertrophy of the left ventricle with an accentuation of the second sound and increased blood pressure. Functional tests may demonstrate a blood pressure rise following exercise and later a rapid fall to a point below the initial pressure, evidencing a lack of integrity in myocardial tone and a deficient cardiac reserve. Associated with these physical signs may be albuminuria with or without casts and indicanuria.

Ophthalmoscopic examination of the retina often

demonstrates early vessel change. Increased tortuosity, beading of the vessels, increase in wall opacity, widening of the central light streak, an interruption of the continuity of the veins where they cross arteries and just beyond this point a dilatation, and evidences of punctate hemorrhages are diagnostic.

Personal observations have led me to believe that a dilatation of the skin capillaries along the course and level of the eighth intercostal space, extending usually from a point midway between the midsternal line and the nipple line to about the midaxillary line, usually bilateral, but in early cases more marked on the left side, is practically diagnostic of early sclerotic changes. It is at this point that a ridging of the skin occurs when stooping or sitting in a position cramping the chest, no doubt obstructing free circulatory movement, and results in this dilatation because of a loss of muscle tone in these small vessels. I have repeatedly made this observation in patients who presented no physical signs and complained of but few sensory disturbances but who presented definite sclerotic changes upon their return a year or so later.

A pharmacodynamic test, using nitroglycerin as a test agent, serves to solve the reason for subjective manifestations in many instances. Many patients, with no physical findings, complaining of distressing symptoms, are promptly relieved with this drug.

Because of the meagreness of physical signs in early arterial disease, one must resort to symptomatic treatment, being very watchful to anticipate a premature or abnormal sclerotic degeneration in patients over forty years of age. The important point to be remembered is that arteriosclerosis begins many years before there is any manifestation, either subjective or objective, of this disease. Indeed, many arteriosclerotic patients are treated for several years as patients suffering from indigestion and the dietary in these cases has not been aimed at a correction of the body metabolism but rather at a local effect on the gastric walls.

TREATMENT.

It is to be kept in mind that arteriosclerotic changes are part of a normal involutional process. If the individual survives long enough, he or she is certain to undergo the cellular changes common to the degeneracy of ageing because of the very structural complexities of the organized multicellular unit. Therefore, arteriosclerosis is physiological as long as the tissue age of the cardiocirculatory apparatus is on a level with the age of the rest of the tissues of the body. However, when from the various causes that have been enumerated, the bacterial toxins, the food toxins and the products of uneliminated cellular waste become mobilized and kinetic, producing a compensatory change in the cardiocirculatory apparatus, which is simply an ageing of these nutritional and waste product channels in advance of the rest of the tissues of the body, the resultant disharmony between the age levels of body tissues is expressed by what I am pleased to call physiopathological arteriosclerosis. Therefore, arteriosclerosis is abnormal only when there is an acceleration of the normal mature arteriosclerotic degeneracy of a given individual or

when the sclerotic changes are premature in their manifestations in relation to the age of the individual.

If recognized early we may hope to remove the excitant factors or at least to hinder or inhibit their manufacture and effect. Cures never occur, for they would be abnormal since arteriosclerotic degeneration is essentially a compensatory process due to the structural complexity of the body. We strive to limit the arterial degeneration to the extent of conforming its age level to that of the other tissues of the biological unit. So to speak, we strive for age harmony of tissues. Premature or abnormal ageing of one tissue secondarily excites the same process in a correlated tissue.

Heretofore, the usual therapeutic efforts have been aimed at reducing blood pressure by the nitrites and potassium iodide, by saline purgation and a restriction of proteids. If an infection was superficial enough to be readily obvious and especially if it produced distressing symptoms it was routinely attended to. The principle of this therapy is essentially based upon elimination. From this theory hydrotherapeutic practice originated, and the work of hydrotherapists, until recently, has been the most efficacious in eliminating the toxic products of the causal factors.

However, the old principles of arteriosclerotic therapy are fundamentally incorrect, because they are based upon a very imperfect and incorrect conception of the disease. Elimination, *per se*, is of benefit temporarily. As soon as one neglects this elimination a reaccumulation of toxic products occurs and again the organism anaphylactically reacts and the disease is fully manifested again. And who can question the stress that is imposed upon the organism by these strenuous eliminatory measures?

Without question, the most logical treatment would be first to find the causes, remove or correct them, and then allow the body to detoxicate itself through the natural avenues and through its own efforts. If the causal factors are removed or corrected a metabolic readjustment takes place and there is no need to drug a patient to reduce his pressure, which is a necessary compensatory reaction, but the pressure will adjust itself to the metabolic needs of the organism in a much more exact manner than is possible for the keenest therapist to discern. Therapy based upon this principle is certain to produce results and the management of arteriosclerotic patients is most gratifying to the patient and to the physician. Arteriosclerosis ceases to be the therapeutic bugaboo of the old days when one grasps the significance of its clinical display and understands the mechanism of its formation.

Foci of infection must be sought for diligently. The gastrointestinal tract must be searched for foci of infection from the mouth to the anus. The intestines contain a great amount of lymph tissue and infection of this tissue is particularly likely to occur as soon as the composition of the digestive juices are altered by a faulty metabolism. Recent investigations have proved that bacteria pass through the intestinal mucosa into the mesenteric lymphoid

tissue and are just as much a source of infection as an abscessed tooth or pyogenic tonsil. Routine blood examination to determine the serology, the cytological status, and other conditions is very necessary. Indeed, much information may be gained from the blood count. The stools should be examined repeatedly and cultures made so as to determine the predominant bacterial flora. It is well to relieve temporarily such patients from all nervous, mental or occupational tension if possible.

To begin with, we know that the dietary has been improper and that a great part of the general cellular sensitization has been brought about by the ingestion of an excessive amount of protein food. Because of this improper dietary, intestinal stasis has occurred. Intestinal stasis alters the chemical composition of the digestive secretions, lowering their germicidal activity and predisposing the intestinal tissues to bacterial invasion. Poor hygiene adds to the misery, and the teeth, the tonsils, the nasal passages and sinuses may become the seat of infection. From these foci many germs escape, to be swallowed, passed on to the small intestines and finally reach the colon, where an excess of protein food residue is delayed in its transit, and supplies a fertile pabulum for the growth of pathogenic bacteria. In addition to these bacteria, think of the countless number that are ingested with food and one may suspect, at least, that the intestinal tissues are having a difficult task in repelling the bacterial onslaught. With this in mind, the scheme of treatment becomes apparent and assumes a logical aspect. First, diet; second, colonic hygiene; third, exercise; fourth, personal hygiene; fifth, temporary palliative therapeutics.

Diet.—Exclude rigidly meat, fish and eggs. The proteins necessary for the dietary balance is derived from milk, cheese, breadstuffs and vegetables. They are nonirritating proteids.

Colon hygiene.—My method is to begin with ounce doses of castor oil combined with ten minims of tincture of iodine and two grains of menthol, every other night for three successive nights, then allowing the bowels to rest for forty-eight hours. This prepares the patient for the cleansing irrigations (hygiene), as the castor oil cleans house from above downwards. The irrigations are begun and are given daily until the colon has been thoroughly cleansed. This is determined by the bacteriological examination of the stool and by the character of the stool. In addition to the irrigations nightly doses of compound licorice powder is given to aid the cleansing process. A special apparatus is used which maintains the irrigating solutions at a constant temperature. The solutions used may be a mildly antiseptic solution, or perhaps a solution of argyrol, protargol or ichthyol. After the colon has been thoroughly cleansed of fecal matter and harmful bacteria one is then ready to plant the colon. This is accomplished by first washing the colonic tract with a solution of lactose so as to furnish culture media for the bacteria that are to be injected into the cecum. Then a pint of a lactose solution containing great numbers of Bulgarian bacilli and the Bacilli acidophilus are introduced through the irrigating tube directly into the cecum. The

patient retains the plant as long as possible. These two bacteria are harmless, if given after the colonic tract has been thoroughly cleansed of harmful bacteria. The success of the treatment depends upon thoroughly cleansing the colon of fecal matter and harmful bacteria before planting the Bulgarian and acidophilus. Unless this is done, it is possible to do much harm. This technic may appear to be simple, but it is not. It requires a constant study of the bacteriological conditions present, in order to determine when it is safe to plant. At times, when the microscopical picture is dominated by pathogenic bacteria, an autogenous vaccine will be found a valuable adjunct to the treatment, as it clears up the infection in the intestinal and mesenteric structures.

This treatment is not to be confused with the high enema or the ordinary high irrigations with which every one has had more or less experience. It is not merely a means to introduce bacteria into the colon, but an efficacious measure in treating infections of the gastrointestinal tract. The surgeon irrigates infected areas, to cleanse the tissues of the germ products, the waste tissue products and because he removes many harmful bacteria, thus aiding the tissues in the process of resolution. The same logic is applied to the colon by this treatment.

This treatment I consider the best and most rapid method of detoxication, and in addition to its detoxicating properties, there is established a new chemical balance in the colon. Putrefactive processes are inhibited by the fermentation products, chiefly lactic acid.

Putrefactive products are the result of bacterial decomposition of protein food residue. The character of the food residue has been changed by the diet and favors the growth of such favorable bacteria as the Bulgarian, the acidophilus and the bifidus. Thus the chemical processes have changed from putrefactive to fermentative, and there is no harmful putrefactive products to be absorbed to further sensitize the body cells. Other foci of infection are treated by methods which are quite familiar to you and need no comment.

Exercise.—Exercise, graded increasingly to a physiological limit determined by the physician, is very necessary because it promotes skin function, elimination by the lungs, a better oxygenation of the blood, a better tissue combustion, heart exercise, circulatory exercise and the formation of optimistic mental attitudes. It is to be emphasized that this exercise is not prescribed for the promotion of pugnacious muscular proportions but chiefly as a heart and circulatory exercise. For this reason, it is well to discourage all forms of games in which the match element is well developed, as the patient is likely to overstep his tonnage.

Personal hygiene.—The patient should be instructed as to nasal, tonsillar, dental and sex hygiene as well as bathing. Habits should be modified. No alcohol and moderate smoking unless there is a distinct reaction to tobacco.

Temporary palliative therapeutics.—If there is insomnia small doses of chloral hydrate is efficacious. If there is precordial distress a nitroglycerin pellet symptomatically used is indicated. For headaches

a small dose of acetanilide combined with caffeine and monobromated camphor usually suffices. Flatulence is usually combatted by resorcin, sodium bicarbonate and pepsin. Palpitation may be helped by atropin or very small doses of aconite hydrobromide, or by a cold water bag to the precordia. Head pressure may be relieved by mustard foot baths. Nervousness usually responds to strontium bromide. For constipation use compound licorice powder or castor oil.

There are a few don'ts which are worthy of mention. First, never attempt to reduce blood pressure by drugs or electricity. Second, never prescribe salines. They do nothing but irritate an already diseased intestinal wall and render it less capable of combatting infectious processes. Third, never deprive your patients of proteids, except those contained in meats, fish and eggs.

The treatment and directions that I have outlined for you will suffice. Rid the body of the patient of the products of food poisoning, the products of putrefaction and the products of pathogenic bacterial activity, and by changing the diet, the habits and the hygiene of the patient you will create a new metabolic level which is infinitely more potent than any drug or electrical treatment or eliminative treatment ever devised by man, for the purpose of arresting the development of the most insidious of diseases, arteriosclerosis, which is being increasingly recognized as the most dangerous menace that is confronting civilization today.

DIAGNOSIS OF GASTRIC DISEASES.*

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In an organ so accessible to all diagnostic measures as the stomach one would imagine the diagnosis of gastric diseases to be comparatively easy. This, however, is not the case, for even after a most careful and complete examination, we are sometimes in a quandary as to the underlying pathological condition. Among the reasons for this the most important, perhaps, are the facts that the anamnesis is so often misleading, and that we are prone at times to place too great reliance on one particular method of examination. The following means are at our disposal in arriving at a diagnosis: 1, the history; 2, physical examination; 3, test meal; 4, string test; 5, x ray examination; 6, stool examination; 7, blood examination. I shall discuss each method separately, endeavoring to point out its particular advantages and disadvantages.

HISTORY.

Although many men have asserted that this is the most important means at our disposal in diagnosing disease, it appears to me to be very uncertain and of little value, at least in gastric disease. We so often find patients complaining of hyperacidity symptoms where a normal or subacid state exists, that after a time we are prone to lose faith in the patient's statements. And again there are numerous extragastric causes that give rise to symptoms

so similar to the intragastric conditions that were we to rely too greatly on the subjective signs we would surely start with an incorrect assumption. I do not wish to give the impression that the history is altogether unimportant, for many useful facts can be elicited from it. In a textbook case of gastric ulcer the history of pain two to four hours after meals relieved by eating, sodium bicarbonate or vomiting, with frequent attacks of pyrosis, is often as accurate in diagnosing the condition as is a complete and thorough examination. However, I have found that it is only rarely one gets so typical a history and so the anamnesis proves of little value in most cases. An ulcer may exist without any of the usual gastric symptoms, the patient complaining of only constipation, loss of weight, or what he calls indigestion, with nausea at times. The most important point in the history, to my mind, is the statement that the patient has a good appetite but is afraid to eat, or that he has completely lost his appetite. The former is the usual case in ulcer, the latter in carcinoma. The time element is another important factor, ulcer cases giving a history of long duration, possibly five or ten years with periods of intermission, whereas carcinoma dates back only a short time and is progressive and constant. This, however, is not nearly so valuable as the previous statement. The fact that the symptoms are aggravated by the taking of acids usually points to a hyperacidity, although this may exist with a normal or subacid condition. Other important factors to be elicited from the history are the statements pointing to disease of other organs, for a mere hint that some uterine or renal disease exists may prove of extreme value in the final cure.

PHYSICAL EXAMINATION.

A careful physical examination is perhaps of as great value as any other one diagnostic method, for by it we learn not only the gastric condition but also the presence or absence of other diseased organs. Referring to the stomach the physical examination should aim to elicit the following: a, points of tenderness; b, masses; c, position; d, size; e, rigidity; f, peristalsis.

a. Tenderness.—Regarding tenderness one must be extremely careful, for nothing is more variable than abdominal tenderness. Tenderness over the abdominal nerve plexuses, particularly the celiac and aortic, may lead one to suspect almost any pathological condition and has often condemned the patient to needless surgical intervention, so we cannot be too painstaking in distinguishing between this type of tenderness and that due to disease of the viscera. Plexus tenderness is always deep, usually bilateral, and exists without rigidity. The principal gastric diseases producing tenderness are, of course, ulcer and carcinoma. In the former there exists, usually, a superficial point of tenderness in the epigastrium about three inches above the umbilicus, which may be elicited by gently tapping the abdomen in this region. Another tender point in ulcer is found just below the left shoulder blade, posteriorly. The tenderness of carcinoma is deeper and is not localized to one point but exists over the whole area involved. In duodenal ulcer the tenderness is usually lower, being situated to the right

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and just above the umbilicus. This, however, resembles gallbladder tenderness and it becomes difficult at times to distinguish between the two diseases. In ulcer pressure inward and upward is the most sensitive, while in gallbladder disease the most marked tender spot is elicited by pressure upward and to the right in a line from the umbilicus to the tip of the right shoulder. In appendicitis we sometimes find a tender spot in the epigastrium, but pressure over McBurney's point is so sensitive as to foreshadow this.

b. Masses.—A mass in the epigastrium should always arouse our suspicion of carcinoma until proved otherwise. Carcinoma cases rarely come to us so early that a mass cannot be felt. A small nodule only may exist although usually the mass is diffuse, superficial, irregular, and freely movable. The principal enlargements from which carcinoma must be distinguished are liver, splenic masses, and those due to omental or peritoneal diseases. In the two former the outlines of the organs can often be traced by palpation or percussion and it will usually be seen that the epigastric mass is part of one or the other organ. In peritoneal or omental diseases, such as tuberculosis for instance, the growths are far more diffuse and less freely movable than is that of gastric carcinoma and we get the other signs of general peritonitis, among which are free fluid in the abdomen, temperature, and pulse reaction.

The mass in benign gastric conditions, such as stenosis or chronic ulcer, is very much smaller and more localized than that of carcinoma and besides does not give the general signs of cancer. Syphilis of the stomach gives no mass unless it exists in the form of a gumma, and this is so extremely rare that a differential diagnosis from cancer presents many difficulties. Even when other marked signs of lues are present I hesitate to call a gastric mass a gumma until cancer has absolutely been ruled out. The mass of pancreatic cyst is situated in the epigastric region but is usually regular and nonmobile. Here, too, cachexia is lacking.

c. Position.—Our means for determining the stomach position in a physical examination are percussion and the eliciting of the splash. In the former we may inflate the stomach or not, and then outline the gastric tympany which gives some idea as to position. The splash of the gastric contents is heard when we tap the abdomen in the epigastric region around the umbilicus. Both of these methods lack the accuracy of the x ray in showing the position but for general purposes may prove sufficient.

d. Size.—This is shown by the methods used in determining position and the same may be said as to the lack of accuracy.

e. Rigidity.—The importance of rigidity in gastric diagnosis lies in the fact that in a perforated ulcer this is perhaps the most important sign. In these cases, if seen early, there is marked and localized epigastric rigidity. Later the entire abdomen becomes rigid, indicating a general peritonitis. In gallbladder disease there usually exists a moderate degree of rigidity in the right, upper quadrant, but nothing like that in a perforated ulcer.

f. Peristalsis.—Visible gastric peristalsis is present in malignant or benign pyloric obstructions that

have existed for some time, allowing the stomach muscles to adjust themselves to the condition by hypertrophy. It is most marked in the benign stenosis, for they are usually of longer duration and do not involve the stomach wall as do the cancer cases. In thin people we sometimes are able to see intestinal peristalsis through the abdominal wall, but this is much more indefinite and lacks the regularity of the peristalsis in pyloric obstructions.

THE TEST MEAL.

This is of equal or even greater importance than the physical examination, and had I one method only to choose in arriving at a diagnosis I would take the test meal, for by it we get a wealth of information. It is perhaps best first to describe the normal, and then the variations in the test meal. In a healthy individual we find that the stomach tube enters easily to about nineteen or twenty inches. This is important, for in cases of cardiac spasms or esophageal obstruction (cancer, aneurysm, etc.) we find a distinct blocking to the entry of the tube, and in gastropotosis the tube may be inserted to twenty-five inches or more before it encounters the lower border of the stomach. In aspirating, which by the way should always be done in taking a test meal, the return in healthy individuals varies between five and thirty c. c. (after one hour) and is of the consistency of well cooked oatmeal gruel, being rather slimy and more fluid than solid. It comes through the tube easily, is light yellow in color, and odorless. I refer to the Ewald test breakfast, consisting of a slice of white bread and a glass of water, which for practical purposes is sufficient, and I have found that the one hour period usually gives as much data as do the newer fractional methods, with less disturbance to the patient. The acidity of such a normal meal is about thirty or forty free acid and fifty or sixty total acid, and contains some starch granules without much else of importance.

The most common deviations from this are found in duodenal or gastric ulcer, carcinoma, achylia gastrica, and gastrosuccorrea. In ulcer should there be no obstruction at the pylorus the return is usually small in amount, varying between five and fifteen c. c., and is a thin, clear fluid containing very few food particles. This, of course, means that there is a gastric hypermotility, the meal having been rushed through the pylorus. Where obstruction at the pylorus exists in chronic ulcer the return is extremely large (from 150 to 500 c. c.), of a very foul odor, and contains not only all of the test meal taken but also elements of previous meals, such as carrots or spinach, which may have been eaten two or three days before. In both of these cases, either with or without obstruction, there is a very high acidity, the free acid being from forty to eighty and the total acid from eighty to one hundred, and they may each contain traces of blood. With obstruction there also exists varying amounts of lactic acid and sarcinae. I have also found the Boas-Oppler bacilli with benign obstructions, so this does not become a differential point from cancer. The test meal in the latter is also large in amount but differs from almost every other condition in its

color, being of a dark, red brown hue, having the so-called coffee ground appearance, which is due to the presence of blood. It is of very foul odor and almost always shows an absence of free acid with a low total acidity (fifteen to twenty). Lactic acid is marked as is blood, and we usually find *sarcinæ*, Boas Oppler bacilli and undigested meat fibres. At times we may find great numbers of gastric epithelial cells and pieces of the neoplasm rarely.

The meal of achylia gastrica is also individual in appearance and a diagnosis can usually be made by the way it returns through the tube. It is always small in amount indicating a gastric hypermotility, but its main feature lies in the fact that it is glairy and is aspirated with great difficulty. The food particles are usually large and undigested and are covered with mucus. It is perfectly odorless and of normal color, contains very little or no free acid and about thirty total. It shows an absence of lactic acid, *sarcinæ* and Boas Oppler bacilli, such as are found in cancer. The test meals in pernicious or secondary anemias often show an achylia, and in these, due to the low blood state, it becomes important to differentiate from cancer. However, they lack the characteristic color of the meal in carcinoma cases and show no signs of retention.

In gastrosuccorhea the stomach contents are markedly increased, averaging 250 to 300 c. c., of a thin fluid consistency, and contain very few food particles. If colored at all they are slightly green from the presence of bile. In these cases there is the greatest amount of acid, about eighty free and one hundred to one hundred and twenty total. There is usually nothing else of importance found. The presence of bile in the gastric contents means a patent pylorus with a regurgitation from the duodenum, and is often found in atonia gastrica. So, taken all in all, I think that it will easily be seen how important is the test meal.

STRING TEST.

Regardless of all arguments against it I believe the string test is of great value. In a normal case the string shows no blood stain but is covered with bile from about the twenty-three inch mark onward. Ulcers on the lesser curvature usually show a marked blood stain at about twenty-one to twenty-two inches, while those on the walls or the greater curvature may or may not show blood. I believe the stain must be fairly well marked to be diagnostic and do not think that a very small, barely visible stain is trustworthy evidence of an ulcer. In pyloric obstruction the string shows no bile stain and in carcinoma the blood stain is diffuse, covering eight to ten inches of the string. So used with judgment the string test becomes of great importance.

THE X RAY.

A peculiar controversy has arisen between röntgenologists and internists. It seems to me that the latter accept the former's statements, with necessary reservations as disclosed by clinical findings, while the x ray specialist is neither willing to accept nor discuss any findings except his own. This is probably due to the fact that x ray findings are visual and they say: "What we see we know." The fault lies not in the sense, but in the interpretation thereof, and if the röntgenologist would more often state

what was visible without attempting always to diagnose, the internist would, I am sure, be grateful. In gastric work when one sees cases diagnosed röntgenologically as pyloric cancer or perforating ulcer where no such condition is found operatively, we necessarily become a little skeptical of x ray findings. The only true method is to put all of our data into the form of a brief and by careful study to arrive at as nearly a correct diagnosis as possible.

In determining the size and position of the stomach there is no method as accurate as the x ray. It is also definite in marked duodenal ulcer with deformity of the cap, in carcinoma where the stomach wall becomes deformed or eroded, and in pyloric obstructions. However, in small lesser curvature ulcers or erosions, where gastric hypermotility and a seeming defect are the only x ray evidences, we must tread very carefully before accepting such proof, for it may be only a perigastric adhesion or a slight spasm in the gastric wall that causes the defect in outline. Röntgenological retention, unless marked and of long duration, is of little value compared with that found by the test meal, for a six hour retention may be ignored and the other types show only bismuth stasis without giving signs of the fluid retention. Early carcinoma at the pylorus, as shown in the röntgenogram, must never be accepted unless there are some clinical findings to support the x ray for we may get a flattening of the pyloric end of the stomach which resembles cancer without such being the case. To divert from the stomach for a moment, it appears that the gallbladder is often accused, röntgenologically, of enlargement where no such enlargement exists and for this we must always be on the lookout. And so I use the x ray in every case, but with reservation.

STOOL EXAMINATION.

The importance of stool examinations lies in the fact that in a duodenal ulcer blood may be found in the stool where none exists in the gastric contents. The other stool findings show pathological conditions of the intestines, or faulty digestion of certain food elements, all of which may play a part in the diagnosis.

BLOOD EXAMINATION.

This must always be done in a complete examination for any gastric condition. The secondary anemia in carcinoma or the pernicious anemia found in some cases of achylia is of utmost importance. The presence of a positive Wassermann reaction may change the complete picture and, in a few cases, a marked eosinophilia may put us on the track of an intestinal, parasitic disease. In some extragastric conditions, such as appendicitis, where all signs point to the stomach, a leucocytosis is important.

I have purposely omitted mentioning many of the conditions causing gastric changes for the sake of clearness and simplicity and have attempted to present briefly the methods of making a complete gastric examination with the interpretation thereof. To summarize, examine each patient completely, take the findings for what they are worth, and place most reliance on the physical examination and the test meal.

46 WEST EIGHTY-THIRD STREET.

AN OPERATION FOR THE RADICAL CURE OF INGUINAL HERNIA.*

BY GEORGE WOOLSEY, M. D., F. A. C. S.,
New York.

More than twenty years ago I settled upon a technic for operation on inguinal herniæ, which proved so satisfactory that I have continued to use it ever since. This operation was a gradual development, combining features of several then in use, and was not therefore original, except as to this combination. In 1896 I published a clinical lecture (1) on a case in which the patient was operated upon in Bellevue Hospital in 1895 for inguinal hernia and urethrorectal fistula. The method then employed was essentially like the original Halsted operation, with figure of eight sutures of silkworm gut through the edges of the incision in the skin and of the external oblique aponeurosis, the cord lying above them. A year or so later, after trying Bassini's method for a time, I adopted my present method but did not publish it, as others having similar features, such as Andrews's method, had recently appeared. I did not see Andrews's publication until many years later and, until I read it, supposed that his operation was identical with mine.

My method has been demonstrated in numerous clinics to scores of hospital interns, one of whom, now a hospital surgeon, recently asked me why I never published it. This led me to look over the literature to see if anything exactly like it had been published. I have found one publication describing an operation practically identical, which I had not read until a few weeks ago. This article was by E. L. Swift, M. D., assistant surgeon, U. S. Army, and was entitled, *A New Form of Operation for the Cure of Inguinal Hernia*. It was the subject of a special report to the Surgeon General of the U. S. Army (2).

The main features of my method of operation are obliteration of the inguinal canal and the external abdominal ring, and fortifying this part of the abdominal wall by, 1, suture of the entire thickness of the musculoaponeurotic wall, along the upper or inner margin of the incision, to the deep surface of Poupart's ligament; 2, by overlapping the lower flap of the external oblique aponeurosis in front of the upper flap, and, 3, transplanting the cord so it will lie superficially to the aponeurosis. I shall describe in a few words the different steps of the operation and some of the reasons for their use.

The aponeurosis of the external oblique is split in line with its fibres from near the upper margin of the external ring to a point two to three cm. above the position of the internal ring, care being taken to avoid injury to the ilioinguinal nerve. It is generally recognized as most important to ligate and excise the sac so high up as to leave no infundibular depression of the peritoneum at the site of the internal ring, which favors recurrence. This high ligation is accomplished, after free exposure of the neck of the sac, by traction on the sac with or without twisting it, then transfixing and ligating

it high up. When the traction or twisting is relaxed the site of the ligature is flat and presents no outward bulging. Twisting is also useful to reduce the contents, like the omentum, which tends to slip by the finger, introduced into the sac in traction to keep the contents reduced. If the operator prefers he may excise the sac high up and close the opening by a continuous suture. Unless the neck of the sac is sutured instead of ligated, transfixion is essential to prevent the ligature slipping off, as I have learned by experience. In an operation for peritonitis, due to an injury in the neighborhood of a hernia, I first operated on the hernia and then, finding no lesion in it, opened the abdomen and found that the ligature had slipped off the neck of the sac, requiring suture of the opening. I rarely resect the veins of the cord unless they are very markedly varicose. According to Halstead (3), the advocate of this procedure, excision of the veins with transplantation of the cord results in atrophy of the testes in ten per cent. of the cases and, not infrequently, in a small hydrocele. This atrophy usually follows a considerable swelling of the epididymis. However, all extraneous fat and connective tissues are removed from the cord to reduce its size.

In case the muscular portion of the conjoined tendon at the internal ring is very thin and weak, I do not hesitate to incise it outward and upward one to two cm. into thicker, firmer muscle, to make a new internal ring, as in Halsted's original operation. This is seldom necessary, however.

In suturing the internal oblique and transversalis muscles to Poupart's ligament, in Bassini's operation, I found that the sutures in the muscle had a strong tendency to cut through. Hence I included the firm inner flap of the external oblique aponeurosis. This serves to take the cutting strain of the sutures off the muscles, as well as to add to the strength of the abdominal wall along the line of the old canal. When this is done there is nothing left to do with the lower or outer flap of the external oblique aponeurosis except to overlap it in front of the inner or upper flap, which still further strengthens this weak area of the abdominal wall. Andrews has well pointed out that when the conjoined tendon is sutured to Poupart's ligament it leaves the aponeurosis relaxed unless it is overlapped.

The main object and most important result of bringing the cord out at the upper and outer end of the incision is to enable one to obliterate the external ring and to make a firm closure of this potentially weak part of the abdominal wall, by carrying the suturing of the musculoaponeurotic flap to Poupart's ligament and the imbrication of the aponeurosis continuously to the pubic bone. Toward the inner end of this suture line the sheath of the rectus is included in the sutures, and in direct hernias it may be necessary to relax this by a liberating incision, or to turn down a flap from it to allow satisfactory approximation to the inner end of Poupart's ligament. The outermost suture through the conjoined tendon narrows the internal ring, care being taken not to compress the cord too snugly. The cord is brought out forward and then is deflected upward by the overlapping lower flap of the

*Read before the Bellevue Hospital Alumni Society, December 3, 1919.

external oblique aponeurosis, so that it passes somewhat obliquely forward and upward and then becomes superficial. Andrews places the cord between the two imbricated layers of the external oblique aponeurosis because he does not like to lose "the valvular arrangement of the passage of the cord." But the anatomical "oblique direction of the cord can benefit nothing when the posterior wall of the canal and the internal ring have a sufficient resisting power to retain the abdominal contents; when they have not, it can afford no assistance" (3).

Cabot (4), in considering the radical cure of inguinal hernia, says that we should make a new canal running upward and outward, so that the downward pressure of the bowels, coming at right angles to the axis of the canal would tend to force its walls together. In the operation I am describing the upward obliquity serves a similar purpose. When we imbricate the external oblique aponeurosis the part of it not overlapped, lateral to the internal ring, will show some relaxation when the patient coughs or strains, unless we carry the incision of the aponeurosis two or three cm. beyond the ring and gradually taper off the overlapping. This also furnishes more of a flap to deflect the cord upward. One, and often two, sutures are always placed external to the cord through the overlapping aponeurosis. It is important to place the sutures on either side of the cord so as to avoid undue pressure on the veins of the cord. This passageway of the cord must be tested with the finger and, if too snug, must be eased by replacing one of the adjoining sutures. There is no more danger or likelihood of compressing the cord here than at the external ring in other operations; perhaps less danger.

To prevent the possible adhesion of the cutaneous cicatrix to the structures of the cord, and to be sure that they are covered by the entire thickness of the subcutaneous fat, I suture this fatty layer separately with interrupted sutures of plain gut. No. 1 chromic gut is used for the other buried sutures. The inclusion of the external oblique aponeurosis in the suture of the muscles of the conjoined tendon to Poupart's ligament, described above, is common to Andrews's operation and that of the Mayo clinic, as described by Judd (5). Judd speaks of including it to help hold the internal oblique, as I have done. Both of these operations also imbricate the external oblique aponeurosis, but the cord is placed between the layers. Fowler (6) describes an operation with imbrication of the aponeurosis, but with the cord beneath both layers and without including the aponeurosis in the suture of the conjoined tendon. Championniere imbricated the aponeurosis in the reverse direction to that described above, but he left the cord undisturbed. In the operation described by Halsted in 1903 (3), and called by Binnie (7) the Johns Hopkins operation, there is a multiple imbrication of the separate layers, but the vas is left undisturbed.

In the original Halsted operation and in those described by J. O'Connor, Postempski, and others, the cord is placed superficially, but there is no imbrication of the aponeurosis, and the latter is not included in the sutures of the conjoined tendon. In hernia associated with undescended testis, the cord

is not transplanted, but the method of suture and imbrication described above is employed.

In the female the operation is very simple and should give no recurrence. The round ligament is not transplanted and is included in one or more sutures at the inner end of the incision, to fasten it to the pubes and prevent its slipping and losing the support it gives to the uterus. The suturing and imbrication are done as usual, except that there is no opening left, the abdominal wall being completely closed. My experience has been mostly with hernia in adults or adolescents. In young children hernia can be cured by a simple operation.

The operation I have described is peculiarly effective in direct hernia for it enables the weak portion of the abdominal wall, at the base of Hesselbach's triangle, to be firmly closed by the overlapping of firm structures, without leaving an opening for the cord to pass through them, as in most operations. It is also as serviceable in indirect hernia as any operation that I know of. There are a number of good hernia operations. I do not assert that this is by far the best, but that in my hands it has proved at least as good as any. I have operated on hundreds of hernia with most satisfactory results. I cannot give statistics, as most of the operations were done before a follow up system was introduced. I have seen a few, but very few recurrences. The operative mortality is practically nil. If recurrences were frequent the chief objection to the operation would be in reoperation, by one who did not know the type of operation done, and consists in the danger of injuring the cord, lying superficially, by making the incision down to the aponeurosis too freely. It is also possible to compress the cord, so as to result in thrombosis of the spermatic veins, but there is no more danger of this than in Bassini's or any other operation.

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117 EAST THIRTY-SIXTH STREET.

Volvulus Appearing as a Late Complication in an Appendectomy.—Gustave Dardel (*Correspondenz-Blatt für Schweizer Aerzte*, December 25, 1919) reports a case in which he performed an appendectomy on an eight year old girl. Nearly a month later the child presented symptoms of ileus, which could not be ascribed to an error of diet. The condition of the child was good at first, but after some hours became bad. Operation seventeen hours after the onset of the symptoms revealed a gangrenous loop of intestine nearly ready to rupture. This loop was excised and the child recovered. The prognosis in volvulus is very grave. The writer states that with the single exception all previously reported cases have proved fatal.

CHOLEDOCHITIS, CHOLECYSTITIS AND CHOLELITHIASIS.*

The Need of Early Diagnosis and Treatment.

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There is probably no six inches of the entire alimentary canal in which states of organic disease are so prone to develop as in the first and second portions of the duodenum; nor is there any zone into which the elements of differential diagnosis enter in a larger and, at times, more perplexing manner. This, the hot bed of digestion, has emptying into it the mixed or mixing secretions from the stomach, the liver, the gallbladder, the pancreas and the secretion from the duodenal mucosa itself.

The physiology of the digestive secretions in normal people from these various sources has become better understood during recent years. The pathological physiology of states of disease in this zone has been the subject of much profitable investigation during a still more recent period. Much light has been thrown upon the subject by means of carefully conducted animal experimentation. The more widespread use of the duodenal tube in the hands of capable students of gastrointestinal disease is contributing greatly to our knowledge by clinical experimentation on human beings, both normal and those suffering from disease. We have learned how to interpret our findings in the duodenum much more clearly and accurately; we can quite easily determine states of duodenitis and can differentiate those that are catarrhal, those that are infected, and those which show unusual exfoliation of dead and dying epithelium; we can feel reasonably sure of separating our more superficial erosive states from those of true ulceration simply because we are gradually training ourselves to make better use of the materials recovered by means of the duodenal tube for more painstaking cytological, bacteriological and chemical studies.

Differential diagnosis has been gradually extended so that we are now fairly sure of the soundness of our investigations into pancreatic states of health or disease, although there remains a very great deal of work to be done in this field. We have made, too, considerable progress in our ability to diagnose accurately many of the states of disease of the biliary system. But, unfortunately, most of our fruitful efforts, as in the cancer problem, have resulted in the elaboration of various methods and various tests that concern themselves in the proving of disease already well established.

Furthermore, our methods of diagnosis have been more largely indirect than direct. We have learned the value of the carefully taken and searching inquiry into the presenting symptoms, we have learned to interpret more clearly the transition of the earlier symptoms into those that in themselves are almost diagnostic, we have extended the scope and the accuracy of our methods of physical examination, and

our eyes and our fingers have gradually been trained to take cognizance of more minute abnormalities than would have been thought possible a generation ago. Much of this has come about through the pioneer efforts of the surgeons, who have taught us by object lessons in living pathological anatomy at the operating table, the correct interpretation of historical syndromes and of data gained by physical examinations.

We have made great progress, too, in the art of diagnosis of various biliary diseases, as we have caught the importance of focal infection and its march from primary to secondary fields of activity. By the more recently accepted methods of examination of blood chemistry we have learned the significance of an increased amount of cholesterol in the blood serum; we have connected some of the clinical links regarding the incidence of pregnancy, tight lacing, and other conditions with gallbladder disease, especially in relation to the formation of gallstones. As a more direct means of diagnosis we have turned to the röntgenologist for the important aid he can now furnish us with his positive and negative shadows of formed calculi or of increased connective tissue formation in the wall of the pathological gallbladder. But direct as is the evidence given by the x ray, it fails us, perhaps, in half of our cases, and even when supplied serves only to prove a pathological state already well established. In other words, the greater part of our diagnosis of gallbladder problems, thus far made practical, supplies us with information pointing to disease so fully developed that we have been handicapped in applying methods of treatment which, to be successful in ultimate cure, have become more and more radical.

The field of treatment by almost common consent has fallen to the surgeon because our accepted method of medical management have woefully failed to bring results other than palliative.

For a little over three years I have taken great interest in developing a more direct means of differential diagnosis of diseases of the biliary system which lends itself admirably not only to the direct detection of organic disease well established, but also gives promise of a better understanding of functional disorders of the liver and gallbladder and the recognition of pathological physiology which may act as part of the precursory states in the development of the later full blown disease.

We have known for some time that it is possible to drain bile from the common duct and from the liver and collect it by means of the duodenal tube for examinations that have been directed largely to the estimation of pancreatic efficiency. (Einhorn, Gross, Crohn). But a great step forward was made when Meltzer suggested to us a means of making the gallbladder contract and discharge its contents. This has opened an entirely new field of clinical diagnosis and investigation and has widened the horizon of our vision for the recognition and correction of the early states of disease of the gallbladder and ducts that may ultimately lead us to the goal of present day medicine, namely, the prevention of another group of diseases which has claimed a heavy toll of suffering and death. I

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allude to gallstones and serious late states of infection of the gallbladder, liver and its ducts.

Meltzer (1), in an excellent article giving his rational conception of the physiology of the filling and discharge of bile from the gallbladder, as governed by his law of contrary innervation, appended a little footnote to the effect that he found that solutions of magnesium sulphate, when locally placed in the duodenum, without first passing over the gastric mucosa, would cause a relaxation of the tonus of the duodenal wall and would thereby relax Oddi's sphincter of the common duct and permit the discharge of bile into the duodenum.

Immediately after the publication of Meltzer's paper, in April, 1917, I was able to demonstrate that the use of magnesium sulphate, locally, in solutions of various strengths, in the duodenum of human beings would very promptly deliver bile through the duodenal tube in varying quantities and of varying quality. It would do this when the duodenum was previously bile free, indicating that the magnesium sulphate had relaxed the sphincter action of Oddi's muscle. Further than this it was noticeable that the character of the bile recovered by means of the duodenal tube underwent certain definite changes in color and viscosity, first a light lemon to golden yellow, then a deeper, richer, more syrupy golden yellow, finally changing to a very uniformly light lemon yellow, thinner and less syrupy than either of the first two; and that this sequence occurred in all normal cases.

It was not long, however, before I examined a patient suffering from symptoms strongly suggestive of biliary disease in whom the second sequence of delivery of the deeper golden yellow bile was replaced by the recovery of over five ounces of deep greenish black bile very viscid, almost tarry. What did this mean? Where was this bile coming from?

The natural inference was that it was coming from the gallbladder. But could it be really possible to drain the gallbladder by magnesium sulphate and the duodenal tube and get it out in a bottle? Yet the cytology of this bile microscopically revealed mucopurulent particles rich in pus cells, large masses of deeply bile stained columnar epithelium, inflammatory debris, masses of bile crystals and was simply swarming with bacteria, chiefly cocci. Culturally the latter turned out to be *Streptococcus viridans*. The patient was operated on ten days later and the gallbladder found to contain bile of the same black color and viscosity and *Streptococcus viridans* was isolated from the bile.

This case and several that had preceded it were the starting point in the use of a method which I first described in a paper (2) and published seven months ago after I had made more than a thousand observations of the practicability of a nonsurgical method of biliary drainage. With certain exceptions, to which I shall later call your attention, it is possible to drain the gallbladder wholly or partially of its fluid contents; to drain the bile ducts and to obtain bile freshly secreted from the liver cells. Furthermore, it is possible to segregate these various biles from their numerous sources by collecting them in individual bottles for chemical,

microscopical and bacteriological examinations that give us a direct method of differential diagnosis between various diseases of the biliary system.

In the direct evidence it furnishes us it far surpasses any diagnostic method yet available, and materially assists our correct interpretation of the presenting history, the physical examination, and the information furnished by the röntgen ray and by the laboratory examinations into the state of gastric chemistry and motility, and of the stools, urine and blood chemistry. But most important of all, it furnishes direct diagnostic evidence of the beginnings of biliary stasis, of masked focal infection that precede the more florid states of biliary disease and give rise later to the symptoms, the physical and laboratory findings that are usually so clear cut as to make a tentative diagnosis of gallbladder disease quite tenable and to warrant the dictum, "We will do an exploratory operation and find out what the trouble really is." This is all very well for the doctor, but a little rough on the patient if there is another reliable and direct alternative method available. In other words, we must learn how to find the direct evidence in the early cases exhibiting the chronic but vague dyspeptic symptoms and not leave it to the exploratory operation to decide whether the trouble lies in the upper right or the lower right abdominal quadrant. Even with the stomach, duodenum and gallbladder well exposed the surgical eye and finger often fails to detect the presence of an early cholecystitis, cholechochitis or duodenitis (usually the forerunner of ulcer), because there is no recognizable gross pathological change (quite ignoring the pathological physiology that precedes gross pathology), and the appendix is then removed usually because it presents a sufficiently pathological condition to warrant it, but not infrequently it is quite innocent and is removed simply because the abdomen is open and it doesn't increase the risk of the operation.

What is the result of this? If there is present concomitant disease of both appendix and gallbladder, as Rosenow's work on streptococci leads many to suspect, and if the gallbladder is harboring streptococci, but in a state of masked focal infection, not severe enough to cause diagnostic symptoms with a parallel gross pathological condition, but nevertheless sufficient to produce a pathological biliary physiology and a positive bacteriology to be found by him who looks, the result is this. The surgeon explores, and finds no upper abdominal pathological condition, no enlarged glands, no stones, no adhesions and the gallbladder expels its contents under forcible digital pressure, (but can it do so under its own muscle power?) and because there is no gross pathological condition the surgeon says everything is normal here, leaves a gallbladder harboring streptococci, and proceeds to account for the symptoms by removal of the appendix. The patient gets well, that is to say, he recovers from the operation, his symptoms improve temporarily, aided by his hospital rest and the removal of his appendix, provided it was in a truly pathological condition; but usually between six and twenty-four months later his symptoms recur, progress in frequency and severity, and change in

character until finally the clinical picture of full blown gallbladder or duct disease presents itself and in the judgment of most doctors operative interference again becomes imperative.

This is not to be wondered at, for it doubtless is true that operative interference is the best procedure at the present time in the properly skillful hands. The surgeons have been successful pioneers in the field of gallbladder therapy because the indirect efforts of the internist with his cholagogues and bile disinfectants, his medicated waters, his diets and his prescription to attend expensively famous foreign spas have been inadequate and uncertain, whereas the direct attack by the aseptic scalpel is productive of prompter results whether good, bad, or indifferent. As Dr. John B. Deaver (3), so apt always in his quotations and epigrams, says in a recent paper, "If thy right hand offend, cut it off." But let us pause a moment and consider. Of course it is easy for the skillful surgeon to cut it off, but it is quite another matter to put it on again if the first experiment doesn't work. It is one thing to remove with impunity the appendix which possesses no (or an unknown) function, (although many an innocent one has been removed in the past, as have healthy tonsils and teeth during their respective crazes), and quite another thing to remove ruthlessly and routinely every gallbladder because some harbor streptococci in their lymphatic tissue and in their walls. As I have said it is all very well with the patient if it works. But suppose, and we know that this often happens, for the surgeons tell us, suppose the common duct remains infected after surgical drainage is completed and later becomes obstructed, what happens then when the distensible reservoir for liver bile has been removed? The safety valve has blown off. The common duct dilates and vicariously tries to assume the duties of the gallbladder; diverticuli may appear, duct bile becomes static, new concretions form, and sooner or later the secreted bile dams back into the liver and biliary cirrhosis has begun. Deaver's biblical quotation is apt, but the title to his paper, *Operation and Reoperation for Gallstone Disease*, is still more apt, besides, the mortality table is not published.

Perhaps if the careful student of internal medicine adopts the motto, "Search and ye shall find," it may eventually be better for the patient, although the work may be slow and laborious and lacking in spectacular brilliance. One has only to peruse some of the better recent papers on gallbladder surgery to realize that operation means facing undeniable risks. Although the mortality has been steadily reduced it was nearly six per cent. in the thousand cases recently analyzed by Smithies (4), with thirty-five per cent. of associated pathological lesions of the upper abdomen found at operation, (enlarged lymphatic glands, acute and chronic pancreatitis, enlarged liver and peptic ulcer), indicating late diagnosis with well established pathological conditions. Added to this are the complications pictured by the surgeon, the skilled full time operator and not the occasional surgeon, of damage to the hepatic and common ducts, the recurring adhesions, the persistent fistulas, the oc-

casional fatal bleeding from the liver or from an accidentally torn blood vessel, the occasional traumatic puncture of the gut on the spilling of infective streptococci bile with resultant peritonitis, to say nothing of Nature's recurrent complications of new stone formation in dilated common ducts again obstructed, necessitating recurrent operations, and we have a true picture of the gallbladder problem as it stands in the light of our present methods of diagnosis and treatment. Certainly it is far better than it used to be, but is it as good as we can make it?

DESCRIPTION OF THE METHOD.

In order to present the method which I hope can be proved in other hands to possess the merits of early or late, direct diagnosis in gallbladder and duct disease, and of potential merit in the treatment of selected patients suffering from these diseases, I must go briefly into the fundamental principles which underlie the method. Much of this has already been presented in four previous papers on the subject (5, 6, 7, 8).

The biliary system consists of a constantly secreting organ, the liver, passing its secretion and excretion, the bile, down a series of tubes guarded at their terminal outlet by a muscle possessing a sphincter action. Placed between the liver and Oddi's muscle sphincter is the gallbladder with elastic walls permitting varying degrees of physiological distensibility, to act as a reservoir for excess bile secreted during the periods when the duct sphincter remains closed. Thus we have a mechanism that physiologically consists of the elaboration of a constantly secreted fluid, which, however, is discharged intermittently.

Upon what does the mechanism of partially or wholly emptying this biliary system depend?

Meltzer's law of contrary innervation (9) as he applied it to the filling and discharge of the gallbladder was briefly to the effect that the sphincter of the common bile duct and the muscles of the gallbladder were supplied with inhibitory and motor nerve fibres from the splanchnic and vagus nerves which acted antagonistically to one another. That when the inhibitory fibres relaxed the tone of Oddi's muscle at the sphincter of the common duct, the motor fibres to the gallbladder caused its muscle to contract and therefore discharge its stored up bile into the duodenum until such time as the sphincter would contract again, when, automatically, the inhibitory fibres to the gallbladder would cause a relaxation in the gallbladder wall, thus preventing a further expulsion of its bile and it would then resume its passive rôle of acting as a reservoir for the bile freshly secreted from the liver. Meltzer pointed out that the normal physiological stimulus to produce biliary discharge lay in the character of the food chemistry which passes through the duodenum. To establish this he quoted the experimental work of Bruns, which showed that normally no bile appeared in the duodenum as long as the stomach was empty, but that the entrance of a food chyme into the duodenum was the signal for the ejection of bile from the common duct. He further quoted the experiments of Rost who proved that injection of peptone or albumosis

through a duodenal fistula in a normal dog immediately caused a discharge of bile from the common duct and proved that this took place by a reflex act which caused a contraction of the gallbladder and simultaneously a relaxation of sphincter of the common duct. Furthermore, Rost had previously established the fact that after animal cholecystotomy the escape of bile through the papilla of Vater became continuous, whereas in normal animals it was discharged intermittently. This argued strongly in favor of Meltzer's law of contrary innervation in the fact that simple cutting into the wall of the gallbladder would destroy the antagonistic action of the nerve supply to the gallbladder and common duct sphincter. This mechanical breaking of the nerve circuit by operation can be easily demonstrated in postoperations in which the gallbladder has been either opened or removed, namely that bile is being discharged continuously into the duodenum so long as the common duct remains unobstructed. Furthermore, I believe this break in nerve conduction is mimicked in disease involving the wall of the gallbladder or in the wall of the duodenum adjacent to Oddi's muscle (duodenal ulcer, duodenitis, duodenal adhesions), because in this type of disease I frequently find continuous discharge of bile into the duodenum with a reflux of grossly recognizable bile in the fasting stomach in early as well as late pathological states of the duodenum and of the gallbladder. This observation of what is certainly pathological physiology appears to me to be a very important diagnostic factor in itself and useful because it may be indicative of early changes. The significance of fasting and digesting biliary regurgitation will be the subject of a future communication.

In regard to magnesium sulphate: Although Meltzer did not specifically state in his footnote that it would cause expulsion of gallbladder bile, but only that it would relax the duct sphincter, the inference was plain that if his law of contrary innervation was sound, anything which would cause inhibition of tonus of Oddi's muscle must, *ipso facto*, cause contraction of the gallbladder musculature. This is not so. Yet it is fortunate for the progress of this work that Meltzer was experimenting with magnesium sulphate for it will call into action this antagonistic or reciprocal action of duct sphincter and gallbladder.

But there are other substances (benzyl benzoate, belladonna, potassium permanganate), that will relax the duct sphincter and yet will not produce expulsion of gallbladder bile. Similarly there appears to be a selective gastric food chemistry that will electively cause expulsion of gallbladder bile in large quantities on the one hand and discharge of pancreatic secretion on the other. For instance, as Rost has already experimentally shown, peptones and albumoses (end products of acid gastric digestion), will call forth a richer and larger quantity of bile in the duodenum. This is seen in the proteid and fat test meals. Whereas, a carbohydrate meal, although bathed in the same acid gastric juice, will call forth more pancreatic juice and little, if any, gallbladder bile; although naturally the bile in the common duct and that secreted by the liver is being discharged during the time that

pancreatic secretion is being poured out. This appears to support the accepted theory of the physiology of automatic (or reflex) discharge of digestive secretions or enzymes according to the chemistry of the food stuffs to be digested. What the exact character of this mechanism may be, whether nerve reflex or blood reflex, or true harmonic action, or a mixture of them, will require further investigation both on animals and on human beings. But when we remember that the pancreatic duct and the bile ducts in ninety per cent. of anatomical subjects discharge their contents through a common ampulla governed apparently by the same sphincter, in each case the sphincter itself must relax to permit such discharge, yet the gallbladder may not necessarily contract each time, certainly not with the same degree of vigor. So it appears that while Meltzer's theory of the physiology of filling and discharge of the gallbladder bile is thoroughly worked out, and while his law of contrary innervation is substantially sound as regards magnesium sulphate (perhaps in this direct duodenal action a true hormone for gallbladder contraction), nevertheless there are certain substances, while they relax the common duct sphincter, have an elective action on the gallbladder or on the pancreas individually, and no doubt certain substances may have a dual action.

A great deal of this problem of physiology remains to be worked out before we can get away from a certain empiricism in the use of various diets and various drugs. The method of direct clinical investigation in health and disease by the duodenal tube, using various chemicals and food chymes, opens up a most attractive and profitable field of work.

To return to the subject of this paper. The method that I have suggested permits of making direct observations on the bile obtained from the several sources in the biliary tract.

To make possible accurate diagnosis of the duodenal biliary zone it is necessary that we adopt means to prevent cytological and bacterial contaminations from the mouth, teeth, tonsils, respiratory tract and stomach from confusing us in our interpretation of duodenal and biliary materials. To avoid this as far as possible I have adopted the following routine method in diagnosis. The use of proper apparatus will aid in the performance of good work. The patient presents himself with a twelve hour fasting stomach. He then brushes his teeth carefully, rinses and gargles his mouth and throat thoroughly, first with a strong solution of potassium permanganate (one grain to the ounce), then with a mildly astringent solution of zinc chloride. The duodenal tube which has stood overnight in a two per cent. solution of lysol is freshly sterilized by boiling and is passed to the stomach. The fasting residue is aspirated and set aside for chemical cytological and bacteriological examination for comparison with the findings later recovered from the duodenum. The stomach is then rinsed to sparkling clearness, using gravity douching from 250 c. c. irrigating tanks or syringe douching, and recovering the wash water in 250 c. c. conical graduates in which can be noted how clean the stomach is, mucus, shreds, mucopurulent plugs, and

other material which microscopically yields much valuable information. After the wash return is sparkling clear the stomach is made astringent with a zinc chloride solution (layoris), and then re-washed thoroughly. It is surprising to observe how often a stomach apparently washed clean, after being made astringent, will press out from the mucosal tubules mucopurulent masses which plug the ducts and which, microscopically, show, in true gastritis cases, masses of gastric epithelial cells infiltrated with small round cells and polynuclear leucocytes and often swarming with bacteria. It is to be noted that none of this epithelium is ever bile stained. After the use of the astringent and washing clean again, the stomach is then disinfected with 250 c. c. of potassium permanganate, one to ten thousand, which is immediately recovered and the stomach again washed clean to crystal clearness. This requires about twenty minutes to accomplish. This, so far as it is possible, prevents contaminated material from the upper zones confusing our interpretations of material later obtained from the duodenal biliary zone. After diagnosis has been completed and local treatment has been instituted it is not so necessary that preparation of the mouth and stomach should be so carefully carried out except when indicated in patients with dirty mouths and dirty stomachs. A little water is then left in the stomach to encourage peristalsis, the patient lies down and turns on his right side and very slowly swallows an additional twenty cm. of tubing to a total distance of seventy-five or eighty cm. from the teeth, according to the length of the thorax. I insist that they take twenty minutes to swallow the twenty cm.; slow swallowing at this point is often the secret of rapidly entering the duodenum. The duodenal tube is then connected to the first sterile aspirating bottle and the duodenal secretion is aspirated to note whether the common duct sphincter is normally closed. The duodenum is then douched with about seventy-five c. c. of a thirty-three per cent. solution of magnesium sulphate. This I believe to be the optimum strength for good sphincter relaxation and gallbladder contraction. Where the gallbladder is found atonic it is sometimes necessary to restimulate its contraction discharge by douching again with half the amount of magnesium sulphate solution.

Before the magnesium sulphate has entirely run in, the tubing is connected to the bottle and gentle aspiration started and the magnesium sulphate returns at first uncolored but within one to six minutes, normally, the sphincter is relaxed and the magnesium sulphate becomes tinged with bile, which becomes steadily deeper until pure bile alone is being recovered. Another bottle is then attached and observations are continued through the glass cannula window inserted in the tubing about eight meters from its proximal end. When the first bile, which I call A bile and believe to be that contained in the common duct plus a few drops from the cystic duct and a few mls, perhaps, of freshly secreted liver bile passing down the hepatic ducts, deepens to a distinctly deeper golden yellow or becomes in any way off color and more syrupy and

of heavier viscosity, this bottle is detached, another quickly attached and drainage of this darker bile allowed to continue until the third transition to a very much lighter yellow and thinner bile appears, when a final bottle is attached to continue the bile collection to the end of the drainage period.

The darker bile appearing in the second transition I call B bile and believe it to be derived almost entirely from the gallbladder, mixed, of course, with a few drops or mls of liver bile. My reasons for believing this bile to be gallbladder bile I have given at some length in a previous paper (8). The third type of very light yellow limpid bile which appears in normal cases in the third transition I call C bile and believe it to be bile recently elaborated by the liver cells and freshly secreted. It has invariably appeared at the termination of each drainage in nearly two thousand observations which I have made up to this time. Of course, one cannot hope to segregate these several biles absolutely unmixed with the other, but if one is careful in segregating them it is surprising how accurately they can be separated with a little practice, and I feel safe in saying that, if carefully done, the majority of A bile is common duct bile, that by far the majority of B bile is derived from the gallbladder and, if the latter has emptied completely, that practically all of C bile is freshly secreted liver bile.

(To be concluded)

WEIGHT, DIET AND EFFICIENCY.

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This paper will discuss the following three subjects: 1, Undernutrition; 2, overnutrition; 3, intestinal toxemia.

The rôle of malnutrition as a factor in lessening efficiency has not escaped notice. Such cases are important; they have been given considerable attention, but are far more numerous than has been realized. Some persons through lack of appetite, are unaccustomed to eat a sufficient amount. Others, while they may consume an adequate quantity, do not choose a properly balanced diet. To bring the expenses within a certain income, the purchase of food is limited. Under these conditions the absence of a knowledge of food values may prevent the dietary from meeting bodily needs. The human body is the most efficient engine in the world. However, it can not operate without fuel, and its efficiency is limited by the fuel supply. Large employers of labor would do well to look into the matter of the proper feeding of employees in order to increase their efficiency. This could be accomplished by educational methods.

A class of cases receiving less attention but very frequently encountered and of great importance is composed of overnourished patients. Many sufferers from overnutrition also have autointoxication of intestinal origin, but there are some who have no indican in the urine and no sign by which the presence of an intestinal toxemia can be established. A third class of cases and probably the most numerous, consists of intestinal poisoning.

Very little will be said regarding the first class of cases because they have received wide discussion and there is little new to offer. I have treated a number of patients who were underweight and noticed that a gain of a few pounds was nearly always attended by an improvement in their general condition, increased energy and a feeling of well-being. An explanation which seems reasonable is that a change in diet sufficient to cause even a slight gain furnishes some reserve for the patient to draw on. Such patients, having lived on an insufficient diet, had no reserve, activity was reduced, and in all probability the metabolism of the body had adjusted itself so as to maintain the individual on a diet too low for the development of an average amount of energy. The increased diet changed the energy balance of the patient from negative to positive.

Cases of uncomplicated overnutrition undoubtedly exist. After a certain length of time complications occur, such as high blood pressure, fatty heart, and nephritis. But the patients become inefficient even before these complications develop. The effect of a weight reduction diet in such cases is sometimes much greater than would naturally be anticipated. The loss of a few pounds is followed by an improvement in breathing and relief from palpitation. The loss of such a moderate amount as ten pounds so markedly increases the ability to climb stairs that the patient speaks in no uncertain terms regarding the improvement. The following case well illustrates this point:

CASE I.—Mrs. J. S., aged fifty-three, housewife, complained of headaches, dizziness, fainting attacks (having fallen on the street on two occasions), and pain in the right arm. The patient was not constipated. Physical examination showed heart and lungs negative, urine negative, even to indican. Blood pressure 90-150. The patient began reduction diet March 21, 1920, her weight at that time being 197 pounds, 12 ounces; March 29th, weight 193 pounds; April 3rd, 191 pounds, 14 ounces, blood pressure 90-144. She had not fainted since starting treatment and the dizziness and rheumatic pains had decreased. On April 9th her weight was 190 pounds, 6 ounces. Patient stated that she climbed stairs more easily. On April 23rd, the weight had reached 186 pounds, 6 ounces. No fainting had occurred since starting the diet and dizziness was practically gone. No rheumatic pains remained and headaches were infrequent as well as trifling, though formerly they had been severe.

CASE II.—A case of obesity complicated by intestinal stasis, Miss B. M. K., aged forty, who began treatment on April 22, 1916. She had suffered from fainting spells, unaccompanied by pain or fever, and a feeling as if her "heart would stop." These attacks had been going on for two months. There was not much shortness of breath, bowels moved daily without medication. There was a bad taste in the morning, appetite good except during the attacks. Though the patient's bowels were regular, the stools were dark green at times, of offensive odor, and comparatively soft. Physical examination showed heart and lungs negative, blood pressure 150, slight tenderness over the right hypochondriac region. X ray examination by Dr. C. W.

Perkins indicated stasis due to adhesions between the colon and the gallbladder, the stomach being pulled to the right, the hepatic flexure of the colon held high, the ileum dilated and ptosed, bismuth being present in the cecum and ileum in the forty-eight hour plate. Colonic irrigations combined with *magnesia usta* by mouth and a weight reduction diet comprised the treatment. On April 22nd the weight was 184 pounds, 15 ounces. From the time treatment was instituted no further fainting spells occurred. On April 29th her weight was 182 pounds; May 27th, 172 pounds; June 23rd, 164 pounds; July 22nd, 150 pounds, 12 ounces. Blood pressure dropped to 120 by July 1st.

These two cases represent types of overnutrition causing inefficiency. The former patient was fast becoming incapacitated for her household duties, but within the short period of a month had reached an efficiency which was only slightly below normal. The second patient, a music teacher, was able, within two weeks, to resume her full duties, and lost no time thereafter.

The third class, intestinal toxemia, has been recognized for many years and has been treated with more or less success. However, a number of severe cases fail to receive the correct diagnosis and there are many mild cases that go unrecognized. These patients can never be properly treated until more attention is given to detail in diagnosis as well as in treatment. The dietetic management is not often sufficiently careful, and there is a tendency to relax it far too soon.

Indicanuria or scatol and indol in excessive quantities in the stool establish the diagnosis. The intestinal flora is never normal, the gram negative organisms (colon bacilli) being replaced in whole or in part by gram positive organisms. Constant absorption of toxins produces the symptoms found in such cases. The most prominent symptoms are lassitude, depression, feeling of melancholy, and inability to concentrate. The patients are frequently unable to attend to business, mental processes being almost suspended. When this condition has existed for a considerable time, kidneys, arteries, and heart are injured by the toxemia. A couple of cases may be cited to illustrate:

CASE III.—J. F., aged fifty-four, a heavy eater and drinker all his life, no headaches and appetite unimpaired. Several years previous to coming under my care depression had been extreme so that business was left entirely to assistants and retirement was intended. Examination of the test breakfast showed low values for free hydrochloric acid, the urine showed no albumin, sugar or casts, but large quantities of indican. The stools showed the following: Color, greenish black; odor, offensive; reaction, acid; indol and scatol were present in large amounts; meat fibres not normally digested, and bacteria almost totally gram positive. The treatment by irrigations, implantations of colon bacillus, the exclusion of meat and eggs and the prescription of milk as the chief protein food, did away with the indican and relieved all of the symptoms of which the patient complained. The patient's previously successful business life was resumed and conducted with unabated vigor.

CASE IV.—Mr. J. P. H., aged thirty-three. History of diarrhea while in the army. Since that time bilious attacks had been frequent and there had been complaint of nervousness, dizziness, lack of power to concentrate, depression, drowsiness and constipation. Stools were dark, almost black, offensive and hard. Examination showed the sigmoid and cecum not well emptied, the tongue was coated, indican five plus. The patient had been variously treated for nervous breakdown, constipation, and stomach trouble. The following treatment caused a quick improvement with a return to normal within six weeks. This patient was unable to perform the duties of his position at the time treatment was started, but he has worked steadily since going back during the sixth week. Meat and eggs were removed from the diet and milk substituted. Other articles of food were allowed freely. Cathartics to evacuate the colon more thoroughly were given and bacillus acidophilus was administered by mouth for months. Agar-agar, bran, Russian oil, and fruit are still being used, as the constipation is a difficult feature in this case.

Although there is nothing new involved in the diagnosis and treatment in the four cases cited, at least two of them had been unsuccessfully treated for a long time; one more than a year and the other for twenty years, and they represent a large class of patients going about from one physician to another, receiving various diagnoses, and generally grouped as neurasthenics. Whether these patients are ill through dietetic errors alone or have some mechanical condition, such as stasis, the control of diet is of prime necessity.

40 EAST FORTY-FIRST STREET.

ULCER OF THE ESOPHAGUS.

Diagnosis and Treatment.

By SAMUEL WEISS, M. D.,
New York,

Attending Gastroenterologist, Jewish Memorial Hospital.

Appreciation of the difficulties in diagnosing obscure conditions occurring in patients who complain of vague and indefinite sensations behind the sternum has prompted me to pay more attention to these symptoms with the express purpose of obtaining a more definite idea of the various underlying causes producing them.

Possibly none of the many striking conditions that are revealed by the x ray or the esophagoscope is so interesting as the demonstration of esophageal obstruction. A dogmatic positive or negative diagnosis is expected and is freely given by the radiographer, and is usually accepted by the physician, for it is a generally accepted axiom that it is a case of either guilty or not guilty, and that if the bismuth food passes freely down the esophagus there cannot be any obstruction. That is not the case, for obstruction is a relative term and depends on three distinct factors: 1, the consistency of the food in relation to; 2, the degree of obstruction, and 3, the power of the esophageal peristalsis, aided by the action of gravity.

Moreover it does not necessarily follow that an obstruction will always be present. Spasmodic contractions of the esophagus are just as frequent as in other parts of the alimentary tract. Where the mucous membrane is inflamed or ulcerated there will be a considerable spasmodic contraction that may, of itself, give rise to complete obstruction, although the underlying cause may be simply a small source of irritation. Perhaps the bismuth food allays the irritation and no obstruction is noted, whereas later a hard particle may set up the irritation and produce a spasm. The esophagus, unlike the rest of the alimentary tract, has approximately only one function, namely, to act as a highway from the mouth to the stomach, and anything that interferes with this function causes the symptom of esophageal obstruction, which may arise from a variety of causes. It is frequently the first and only sign of such serious conditions as new growths and aneurysms, while comparatively innocent lesions may produce the same trouble.

ANATOMY.

The description of the esophagus as a tubular organ of definite diameter is common in the books of descriptive anatomy. Like the rest of the alimentary canal it is a potential space when empty and is capable of considerable distention. The esophagus is divisible into three parts: 1, cervical, five cm.; 2, thoracic, eighteen cm.; and 3, abdominal, two to three cm. Clinically in the upper portion it is in relation to the trachea; at the level of the bifurcation of the trachea, to the left bronchus, the bronchial glands, the pleura, the pericardium and the recurrent laryngeal nerves; and lower down, below the bifurcation, to the aorta, and this is important. The diameter of the lumen increases on the average from above downward, varying from seven to twenty-two mm. Normally, certain constrictions occur at different levels. This narrowing is present at four points: opposite the cricoid cartilage; above the arch of the aorta; below the arch of the bifurcation of the bronchi, where it is crossed by the left bronchus, and at the diaphragm. Besides these there may be other points of narrowing which are without pathological significance.

On swallowing corrosive fluids, or when there is injury on passing esophageal bougies, the damage occurs most often at the level of one of these normal constrictions; scars are more common in these situations, and cancers also tend to develop in the same region.

In the anamnesis, difficulty in swallowing, pain on swallowing, a localized feeling of pressure in the course of the tube, or regurgitation of food makes an examination of the esophagus necessary. Dysphagia may set in suddenly or may begin insidiously and increase gradually. In esophageal stenosis, especially, the patients state that they have been compelled to use food of an increasing softness of consistency until finally only liquids could be swallowed. The patients either regurgitate food immediately, or they feel that it remains in the esophagus to be regurgitated later, perhaps in a decomposed, foul smelling state. Such patients emaciate rapidly. Where there is great variation in the ability to

swallow, a cardiospasm or a diverticulum of the esophagus may be suspected. Pain on swallowing may be sharply localized (ulcer, carcinoma), or may be diffuse throughout the whole length of the gullet (esophagitis). Regurgitation of food is characterized by the absence of hydrochloric acid; the reaction is usually alkaline and contains mucus. The most frequent location of esophageal ulcer, especially in males, is at the fourth constriction. About three quarters of all esophageal ulcers are found in this location. The next more frequent location is opposite the cricoid cartilage, and finally it is found in the narrowing where the left bronchus and aorta cross the esophagus.

The ulcers may be round, irregular or semicircular. In syphilis they are circular. Several ulcers may be found together or they may extend up and down the tube, or may occur at both ends of the esophagus. The right posterolateral wall seems to be a favorable site for ulcers occurring at the fourth constriction.

ETIOLOGY.

The etiology in many cases of esophageal ulceration seems to be obscure. Some of the probable causes may be: 1, pressure of the cricoid cartilage on the esophagus, or to pressure from a struma, an aneurysm, or a neoplasm; 2, in regurgitation of the gastric juice, to esophagomalacia or peptic ulcer; or 3, in esophageal varix to abrasion over the varix with formation of a varicose ulcer; 4, stenosis of the pylorus or duodenum or an hourglass stomach; 5, the intake of quantities of hot or cold food and hurried eating; 6, syphilis; 7, tuberculosis, malignancy; 9, swallowing of foreign bodies, as a fish bone or chicken bone, or piece of metal, may cause a scratch or erosion of the mucous membrane and generally ulceration; 10, injuries of esophagus in attempted suicide; ingestion of corrosive fluids.

SYMPTOMS.

The symptoms of superficial ulceration of the esophagus are insignificant. Usually in the long standing and deepseated ulcerations marked symptoms are produced. Difficulty in swallowing is present and is one of the chief symptoms in differentiating it from gastric ulcer. When a patient complains of pain immediately on swallowing and also has marked tenderness over the sternum, the internist should think of probable ulcer of the esophagus. Sometimes pressure over the lower border of the spleen may cause pain. On account of the difficulty in swallowing and because of the pain, patients often fear to take food, and become weak and emaciated; some have nausea, others vomit.

DIAGNOSIS.

The diagnosis in these cases depends upon the location of the ulcer, and we employ several methods which have their advantages and disadvantages. Röntgenoscopy and röntgenography of the esophagus will show whether or not there is a lesion or spasm and will guide us in referencè to employing a bougie. The use of the bougie should never be attempted unless the bismuth shadow shows a definite funnelshape at its lower end; a bougie may wander in an amazing fashion far away from the opening into the passage. Force must never be used, and even with the gentlest manipulation, a round-

nosed bougie may pass into an ulcer and down between the mucous and muscular coats, giving a sense of absence of obstruction.

Einhorn's string test for determining the location of the ulcer may give us little information, because not every ulcer bleeds, and even if it does, the thread may not come in contact with the ulcer and may mislead the internist who depends upon finding the red stain on the thread.

The most reliable instrument for making the diagnosis, locating the lesion and the kind of ulcer, is the esophagoscope. This instrument in the hands of a capable man is the most useful aid in diagnosing esophageal ulceration.

TREATMENT.

The treatment of esophageal ulcers, when properly carried out, yields gratifying results. I employ the duodenal tube for feeding, and give large doses of bismuth and magnesia by mouth. For the thirst a normal saline by rectum, preferably in the form of the Murphy drip, is given once or twice daily. The patient is kept in bed for the first few days, then he is permitted to get up, and for ten days or longer the tube is kept in the stomach and then withdrawn. The first two days after the tube is removed the patient receives milk with sweet cream and three eggs daily. On the third day, toast and butter and fine cereals are allowed. Should the symptoms recur when the patient goes on a more liberal diet, we go back to the fluid diet, and if that is ineffective another course of duodenal feeding should be inaugurated.

CONCLUSIONS.

In making a diagnosis it is the internist who is usually the first one to be consulted, and therefore it is his duty to analyze carefully the symptoms and determine the cause of the ailment. He should not merely tell the patient that he is nervous or some such makeshift diagnosis and prescribe a placebo. It is his duty to employ every available means to come to a definite diagnosis, and in many cases prevent future trouble. Should he be incapable of availing himself of the modern methods, it is no more than just that he refer the patient to someone who is able to employ the numerous diagnostic instruments and interpret the findings in a given case.

616 MADISON AVENUE.

PARIS LETTER.

(By our own correspondent.)

PARIS, May 30, 1920.

The Offensive of the Rockefeller Mission Against Tuberculosis.

If the Rockefeller Mission for the Prevention of Tuberculosis, instituted in Paris in 1917, fails to achieve the miracle of actually stamping out tuberculosis, it will at least have succeeded in an almost equally difficult task, viz., that of drawing together thousands of persons to Paris to hear lectures on the prevention of the disease.

In preparation for a recent gathering, M. Deschanel, President of the French Republic, and M. Léon Bourgeois, President of the Senate, were in-

duced to accept the honorary presidency of the convention, which was to be held on the heights of Ménilmontant, the extensive quarter of workmen's dwellings in the east of Paris. Some doubts had been entertained as to whether the affair would prove a success and the public take kindly to this new kind of propaganda. The meeting, however, was a splendid success. Although the daily press had hardly made mention of the proposed gathering, which was advertised largely by posters put up in the workingmen's quarter, the hall, accommodating three thousand persons, was completely filled, and hundreds had to remain standing.

The Ministry of Social Hygiene was represented at this gathering by M. Desmars, the chief of one of its services, who expressed the deep-seated gratitude to America felt by France for its campaign against tuberculosis and the large funds generously supplied for the purpose. "The Americans," he said, "have organized in France 108 dispensaries for tuberculous patients, arranged for a great number of lectures and motion picture demonstrations, saved hundreds of lives, and brought back hope to thousands of human beings afflicted with the dread disease." Special praise was bestowed upon Dr. Stewart, director of the propaganda against tuberculosis, and upon Mr. Bernard Wyatt, of New York University, who represented the Mission for the Prevention of Tuberculosis at the meeting.

Mr. Wyatt having thanked the speaker in a brief speech and made the statement that "everyone in America would be glad to stand by the side of our French friends in combating the disease," the floor was given in succession to the two main speakers, Dr. Bezançon, of the Académie de médecine, and M. Jean Blaize, special lecturer of the Mission for the Prevention of Tuberculosis.

"Tuberculosis," said Dr. Bezançon, "caused 86,113 deaths in France in 1911, these deaths constituting one tenth of the entire mortality in the country. To take effectual measures against it, it is necessary to be familiar with its causes and mode of development. Thirty years ago tuberculosis was commonly thought to be an inherited affection, and this idea is still entertained by a large number of persons. Already in 1865, however, Villemin, the French professor, maintained that tuberculosis was not inherited but was transmissible, and twenty years later this view was confirmed by the discovery of Koch's bacillus.

"Thus, the question as to the manner of preventing transmission of the disease presents itself. In this connection there is a great difference between tuberculosis and certain other diseases, such as measles and scarlet fever. Transmission of tuberculosis commonly occurs only after prolonged and repeated contact with a patient. The risk of transmission must, therefore, not be overemphasized, and it would be inhuman to insist upon complete isolation of consumptives, as has been the custom in the case of lepers. One need not hesitate to care for and bring cheer to a consumptive. Children, however, being extremely sensitive to the tubercle bacillus, must be carefully kept away from such patients. On the other hand, the risk of transmission among adults must not be overlooked." Dr.

Bezançon explained how uncleanness, unwholesome dwelling quarters, and badly planned workshops favor transmission of the disease. "We are constantly being told that tuberculosis is a poor man's disease. This is true only in that poverty compels families to live in overcrowded and dirty quarters, in close contact with patients who cannot be placed in isolation." Special stress was laid on the absolute efficacy of suitable prophylactic measures. The sputum being the vehicle of the tubercle bacillus, the main precaution consists in avoiding contact of any trace of the sputum with other persons. This precaution is one that can be instituted in a thorough manner, and in a well ordered sanatorium there has been no instance of transmission of the disease to any physician or nurse. In concluding, Dr. Bezançon spoke of the good work accomplished in the dispensaries and especially by the visiting nurses.

M. Jean Blaize spoke of various practical measures helpful in the tuberculosis prevention: Dry sweeping was condemned; curtains should be done away with; one should sleep with the windows open; tobacco and alcohol should be discarded; beans constitute a useful food. These various items of wholesome advice were delivered in such a manner and with such an unexpected choice of words that the listeners were moved to laughter every few minutes. Thus, speaking of tobacco, he said: "Tuberculosis, we are told, is transmitted by the sputum. But why do we spit? Spitting is a very unattractive habit. Women don't spit. Why not? Mainly because they don't smoke. Spitting is the privilege of men who smoke. The cigarette smoker spits a little. He is like the Petit Morin (a small affluent of the Seine River). The cigar smoker spits more, like the Grand Morin. The pipe smoker is like the Seine when it overflows its banks. The chewer of tobacco—he is like the Black Sea. Man is the only animal who smokes, and it is really America's fault, for it was Christopher Columbus who brought back the weed with him. Fortunately, at the present time the Americans are exporting habits of a different kind."

As was to be expected, the managers of the gathering also brought music and films into play. A complete Parisian regimental band played between the lectures. The most interesting film was that representing the open air school at Plessis-Robinson, a school originally of American conception and managed by the Bureau of Hygiene of the Department of the Seine. In this institution shelter is given to children predisposed to tuberculosis, and remarkable results have been obtained. The sight of these children playing or working in the open air, well cared for and watched, could not fail to encourage parents to separate themselves for awhile from their sickly offspring. Picture propaganda is highly effective.

The Ménilmontant gathering is to be followed by many others. The medical authorities are earnestly supporting the Rockefeller Mission. The large sums expended to insure continuity of endeavor are far from being wasted, and undoubtedly this first great meeting will be followed by material success.

Editorial Notes and Comments

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NOTICE TO OUR READERS.

The index to Volume CXI of the New York Medical Journal will be printed separately. Copies of this index can be obtained by writing to the editorial department.

PUBLISHER'S ANNOUNCEMENT.

At no time since the founding of the NEW YORK MEDICAL JOURNAL in 1843 has the situation in regard to publishing been so acute. The prices of printing and paper have gradually risen and in many departments expenses have increased three fold during the past four years. Some months ago we were confronted by a strike of the printers, but at great expense and trouble, not to speak of loss, we brought out the JOURNAL with regularity, never missing an issue. Following this there was a shortage of paper, due to a tie up of transportation facilities, and again we published the JOURNAL without the loss of an issue. We transported paper by automobile from a great distance. In spite of these difficulties this service was maintained for our readers by a constant struggle.

Through all these adverse circumstances we have constantly been improving the quality of the JOURNAL, making it of ever increasing value to our readers. Our special correspondents in foreign countries have been on the alert for papers by European workers, so we could keep our readers informed of the latest advances in science across the sea.

We have established a department of book reviews, for which we secure the services of workers in the various fields of interest to the physician. This department has proved to be a guide to the medical men in this country. We had felt for some time prior to establishing this department that too little attention had been given by medical journals to the textbooks of medicine. In these books are usually found the most careful work of men in medicine, frequently the consummation of years of study and work. In comparison with the space given to hurriedly written papers, frequently a rehash of things published many times before, and to extemporaneous remarks at medical meetings, under the head of proceedings of societies, books received scant consideration.

We arranged special numbers of the JOURNAL in order to group together under one cover the latest findings of leading medical men in each particular specialty. These numbers are of distinct service, rendering easily available information concerning a special subject for which one may be looking. So far we have had special numbers devoted to endocrinology, neurology, gynecology, the alcohol question, dentistry, diabetes, ear, nose and throat, and gastroenterology.

In order to keep things moving and carry out our policies we shall reduce the size of the JOURNAL slightly during the months of July and August, resuming the normal size with the first issue in September. There will be no reduction, however, in the amount of original material. The high standard set for our department of book reviews will be maintained. The special numbers will be continued. The material which we shall present will be chosen with great care and only those things which we believe will be of interest to the medical practitioner will be given space.

THE SYMPTOMATOLOGY OF VOLVULUS OF THE CECUM.

The onset of volvulus of the cecum occurs in one of two ways; the process either commences suddenly with violent abdominal pain and colic, accompanied by vomiting, or, more commonly, the patients are constipated and suffer from abdominal pain, particularly in the right iliac fossa where true paroxysms of colic are complained of. These premonitory phenomena, the result of movable cecum, are generally regarded as due to the appendix.

The pain in volvulus is intense, all the greater the tighter the constriction. It may be continuous,

but usually it takes the form of colic, recurring in paroxysms at the time of intestinal contraction. As the evolution continues the intestine becomes distended, paralysis of the gut ensues, abolishing peristalsis. The colic then decreases progressively and is replaced by a more fixed pain, due to beginning peritoneal reaction. The pain is usually situated rather low in the right iliac fossa, but its site varies, and it has been known to occur in the hepatic region or on the left side. In these cases the location of the pain was due to a complete dislocation of the cecum.

The pain extends progressively throughout the abdomen, to the back and sacral region. It is spontaneous, but the patient can lessen it by changing his position. Abdominal palpation does not usually reveal any point of exacerbation, and in fact little can be ascertained by it. The patients compare the pain to deep crushing or a sharp constriction within the abdomen.

Vomiting appears soon after the onset of the pain and is almost always a constant symptom, statistics showing that it is absent in only ten per cent. of the cases. It may come on as late as twenty-four hours after the onset of the abdominal pain, but this is exceptional, and persists with tenacity, although some instances have been recorded where it temporarily subsided or even completely disappeared. It is interesting to note that the vomiting is not free, as in other types of intestinal obstruction, and it is rarely fecaloid.

The immediate consequence of volvulus is an arrest of the feces and gas, and this is likely to be complete from the start; but there are a few exceptions to the rule. When once the obstruction is realized the lower portion of the large intestine may empty itself, spontaneously or otherwise, but only during the first few hours following the volvulus. The paresis of the large intestine is the factor of its reflex paralysis.

The pain which existed at the onset declines little by little, but when the paroxysms have subsided a new symptom appears, namely, abdominal distention, which renders the peristalsis more clearly visible. This distention appears as soon as the pain and vomiting have subsided and reaches an enormous degree, but its principal characteristic is that it is distinctly localized in the region of the volvulus, because an abundant exudation of fermentable fluid takes place at that point which results in the production of a considerable quantity of gas. The site of the distention varies; it may occur in the peri-umbilical region or in the left hypochondrium. In one case it formed a sonorous oval tumor, similar in shape to an ovarian cyst. Occasionally the tym-

panic area encroaches upon the umbilical region and becomes evident in the right hypochondrium. As operations have shown, the fundus of the cecum is above and to the left and ascites is present, usually in so small an amount that it cannot be detected clinically. When present, it is a cloudy or frankly hemorrhagic fluid. Such are the symptoms peculiar to volvulus of the cecum. The general symptoms, such as the pulse, and normal or subnormal temperature, are the same as those encountered in any kind of intestinal occlusion.

THE CHOLESTERIN CONTENT OF THE FECES.

The study of the cholesterolin content of the feces is interesting because it forms a necessary complement to the study of cholesterolin in the bile. In the feces it is no longer found in the form of cholesterolin but largely in the form of a product of reduction, namely, coprosterin. The study of cholesterolin in the feces cannot *a priori* furnish any indication relative to that of the bile, because it is now a well established fact that the cholesterolin thrown into the intestine by the bile is in large part absorbed by the intestinal epithelium. The knowledge of this important datum is due to the splendid researches of Dorée and Gardner. They first showed that what was formerly designated under the name of hippocoprosterin is nothing else than phytosterin which passes untransformed in the intestine of the horse. As far as the cholesterolin thrown into the intestine by the bile is concerned, the feces of this animal do not contain a trace. Continuing their researches in the dog they note during different diets that the quantity of cholesterolin eliminated by the feces of the animals was invariably inferior to that which is normally thrown into the intestine by the bile. They, however, remarked that this fecal elimination of cholesterolin, very minute with a diet poor in cholesterolin—bread, cream and white of egg—is notably higher following a meal rich in cholesterolin, such as brains.

The fecal cholesterolin is above all the result of the quantity of cholesterolin entering into the composition of the food ingested. It is largely composed by the more or less considerable portion of cholesterolin in the food consumed which has escaped intestinal absorption. In reality, the cholesterolin ingested with food is not integrally absorbed by the intestine. During their experiments on rabbits, dogs and cats Dorée and Gardner observed an absorption of from forty to sixty per cent. of the total cholesterolin contained in the food. Chasoburo

Kusumoto came to similar conclusions and showed the influence of diet on the quantity of cholesterol eliminated by the feces. Klein has also pointed out that intestinal absorption is not more pronounced with the ethers of cholesterol than with free cholesterol and that in all circumstances the presence of fats is necessary. The more recent elaborate and remarkable experiments carried out by Grèze confirm in general the findings and conclusions of the former observers.

CHOLESTERINEMIA IN DISEASES OF THE LIVER.

As is known, hypercholesterinemia is absent in the hepatic cirrhoses and congenital or acquired hemolytic icterus likewise undergo their evolution without an increase of cholesterolinemia and this is still another element which opposes the hemolytic jaundice to all other kinds of icterus. On the other hand, Grigaut has found hypercholesterinemia frequently in those states which accompany disturbances of the biliary secretion and here, as in cases of Bright's disease, it may attain very high percentages, as much as fifteen grams to the litre.

A certain relationship exists between the percentage of the cholesterolinemia and the intensity of the reaction of the other elements of the bile. For example, in catarrhal icterus the hypercholesterinemia, cholemia and bilirubinemia usually follow a parallel evolution. This does not occur of necessity and there are numerous cases in which there is a dissociation between the retention of cholesterol and that of other elements of the bile—bile salts and pigments. It is known that during cholemic states the bile salts and pigments may be retained independently from each other in the organism and a similar dissociation occurs between bilirubinemia and cholalemia. It is the same for hypercholesterinemia which, although appearing generally in subjects accompanied by cholalemia, may nevertheless be met with outside of any bilirubinemic or cholalemic states, thus constituting an isolated state of biliary retention. This is what is encountered in lithiasic and xanthelasmic states where a marked hypercholesterinemia may exist without any jaundice being evident.

Inversely, in icterus from retention, hypercholesterinemia may be absolutely wanting regardless of the intensity of the bilirubinemic or cholalemic retention. The dissociations thus observed, even in icterus from retention, between the constituent elements of cholelentic states cannot be explained by a simple mechanical phenomenon which obstructs the flow of bile at some part of the liver, but supposes

an active interference of the hepatic cell in every case. This is an important point as regards the part played by the hepatic cell in the metabolism of cholesterol.

One of the clinical consequences of hypercholesterinemia in hepatic subjects is the xanthelasma which until recently has been empirically attached to cholemia but in reality, as Chauffard and La-roche have shown, is directly related to an increase of the cholesterol in the serum. The nodules formed by the fatty ethers of cholesterol which are observed to develop in icteric and diabetic subjects are due to a deposit in the skin of the cholesterol in excess in the blood.

A marked hypercholesterinemia is likewise at the bottom of biliary lithiasis and Chauffard has shown the importance belonging to this hypercholesterinemia in the pathogenesis of this other local deposit of cholesterol. The relationship between cholelithiasis and pregnancy and typhoid fever can be explained by the hypercholesterinemia. Let it be added that the hypercholesterinemia which is usual in cholelithiasis is an excellent differential sign for the diagnosis of doubtful forms of biliary lithiasis.

THE PRESENCE OF HEAVY METALS IN FOOD.

An occasional sensational headline in the papers about a man having died through eating copper, creates the impression that in most canned or preserved food there lurks mortal poison. But the important fact should be noted that the heavy metals are well borne for a long time if taken with food, indicating the intestinal canal exerts a protective action against the metals and their salts. Yet, disturbance of function of the intestinal canal or structural changes of the mucous membranes of stomach and intestines may occur; the protective action of these organs may cease and the metals thus gain access to the different organs, causing serious damage.

According to recent analyses, the quantity of zinc in oysters may reach 1.15 gm. to the kilo; in baker's yeast 0.414 to the kilo. Dried eggs may have 2.4 gm. to the kilo. Copper in oysters varied between 52 and 53.9 a kilo; canned vegetables may have up to 2.75 gm., 0.25 gm. of nickel sulphate may be present in green peas. Tin has been found up to 10 to 450 mg. to the kilo. Lead is often present in small quantities.

Dr. Salant, writing on this subject in the *Journal of Industrial Hygiene*, June 1920, says that: "The unreflective will point out the very small quantities ingested. The analysts admit this, but produce cumulative evidence of the harm from small quantities frequently taken into the system, and at any rate, the public is entitled to the benefit of the doubt in the case of metals the entire harmlessness of which rests in the fact that no sure results have been obtained."

News Items.

Bequests to Hospitals.—By the will of William F. Armstrong, the Methodist Episcopal Hospital, of Brooklyn, will receive \$25,000 to establish William O. Armstrong beds; the General Hospital Society of Connecticut will receive \$25,000, and the Bridgeport Hospital, \$10,000.

Coordinating Child Health Work.—The American Red Cross announces that a council of coordinating child health activities has been formed. The societies represented in the council are: American Child Hygiene Association, American Red Cross, Child Health Organization of America, National Child Labor Committee and the National Organization for Public Health Nursing.

National Association for the Study of Epilepsy.—At the nineteenth annual meeting of this association, held recently in New York, Dr. G. Kirby Collier, of the Craig Colony of Epileptics, Sonyea, N. Y., was elected president, succeeding Dr. L. Pierce Clark, of New York. Dr. Joseph J. Williams, of Woodstock, Ontario, was elected vice-president, and Dr. Arthur L. Shaw, of Camden, N. J., was reelected secretary-treasurer.

New Dean of Yale School of Medicine.—Dr. Milton C. Winternitz has been elected dean of the Yale School of Medicine, to succeed Dr. George Blumer who resigned recently. Dr. Winternitz was graduated from Johns Hopkins University in 1903 and served on the faculty for some time. He joined the Yale faculty in 1917 and during the war was in charge of research in pathology and bacteriology at the University for the Bureau of Mines.

Personal.—The honorary degree of doctor of science was conferred upon Mr. Herbert C. Hoover by Tufts College, at the annual commencement held on June 21st.

Dr. H. Violle has been appointed by the League of Red Cross Societies as medical liaison officer between the central committee of the French Red Cross, the League of Red Cross Societies, and the French Ministry of Health.

Dr. Richard P. Strong, of Harvard University, chief medical officer of the League of Red Cross Societies, has been elected to honorary membership in the Serbian Medical Society.

New York and New England Association of Railway Surgeons.—The thirtieth annual session of this association will be held at the Hotel McAlpin, New York, on Tuesday, October 19, 1920, under the presidency of Dr. William B. Coley, chief surgeon of the New York Central lines. Special effort is being put forth by the officers to make this one of the most successful meetings of the association. An attractive program is already nearly completed. Dr. George W. Crile, of Cleveland, has accepted an invitation to deliver the address in surgery, and other leading surgeons will read papers. Two chief claims attorneys will present papers, and the president of an Eastern trunk line is expected to be present and address the members of the association. Dr. George Chaffee, of Binghamton, N. Y., is corresponding secretary of the association.

Dr. Hyslop's Brain.—Dr. James H. Hyslop, a well known psychologist and editor of the *Journal of the American Society for Psychological Research*, died at his home in New York on June 17, 1920, of cerebral thrombosis, and his brain was given to Dr. Edward A. Spitzka, of New York, for scientific study. The brain had not been weighed on removal, but when received by Dr. Spitzka, after five days' immersion in five per cent. formaldehyde solution, its weight was 1,290 grams, or 45.5 ounces avoirdupois.

Medical Museum Congress.—The thirteenth annual meeting and exhibition of the American and Canadian Section of the International Association of Medical Museums was held April 1st and 2nd at Cornell University Medical College, in conjunction with the meeting of the American Association of Pathologists and Bacteriologists. The meeting was under the presidency of Dr. O. Klotz, of Pittsburgh. Officers elected for the ensuing year were as follows: President, Dr. W. M. L. Coplin, Philadelphia; secretary treasurer, Maude E. Abbott, Montreal; assistant secretaries, L. Gross, Montreal, and H. Goldblatt, Cleveland.

American Laryngological, Rhinological, and Otological Society.—At the annual meeting of this society, held in Boston, on June 2nd, 3rd and 4th, the following officers were elected: President, Dr. Lee Wallace Dean, of Iowa City, Iowa; vice-presidents, Dr. Harmon Smith, of New York, chairman of Eastern Section; Dr. Joseph C. Beck, of Chicago, chairman of Middle Section; Dr. Joseph B. Greene, of Asheville, N. C., chairman of Southern Section; Dr. William V. Mullin, of Colorado Springs, Colo., chairman of mid-Western Section; Dr. Hill Hastings, of Los Angeles, Cal., chairman of Western Section; Dr. Ewing W. Day, of Pittsburgh, Pa., treasurer; Dr. William H. Haskin, of New York, secretary; Dr. George L. Richards, of Fall River, Mass., chairman of Publication Committee. The next annual meeting will probably be held in Atlantic City, N. J., somewhere about the first of June, 1921.

Plague in America.—In accordance with forecasts made by the United States Public Health Service over a year ago, bubonic plague has made its appearance in the United States. At present, foci of the infection are known to exist at New Orleans, Pensacola and Galveston, and in Tampico and Vera Cruz, Mexico. In Vera Cruz, the disease appears to have assumed the proportion of an epidemic. Calling attention to this outbreak of plague and renewing his warning regarding the introduction of plague from Mediterranean ports which are known to be infected, Surgeon General Hugh S. Cumming urges communities throughout the country, and especially along the coast, to inaugurate rat extermination and ratproofing campaigns. With the definite knowledge now possessed regarding the transmission of this disease, and especially as to the rôle played by rats, the situation should cause no alarm or panic among the people of this country. Nevertheless the very real menace of bubonic plague calls for an energetic campaign of extermination directed against the rat, and other rodent pests.

Book Reviews

TEXTBOOK OF PHYSIOLOGY:

A Textbook of Physiology. By RUSSELL BURTON-OPITZ, S. M., M. D., Ph. D. Illustrated. Philadelphia: W. B. Saunders Company, 1920. Pp. v-1185.

This work, which appeared recently, takes a prominent place in the literature of medical physiology. It is a valuable book of reference for the medical student or the physician who has maintained his interest in physiology. The essential point in which this book differs from others of its type lies in the emphasis which is given to the clinical aspect of the subject. It is not a book for the research worker. On every page there is evidence that it was written specifically for the clinician.

The work is arranged in logical sequence, treating in turn the various physiological functions of man. There is enough discussion of comparative physiology to give the reader some idea of the wide application of physiological laws. The essential propositions are stated with brevity and simplicity, although in the more general discussions one is led into rather deep waters. There are many references to physiological literature, and the work of the older foreign physiologists especially is cited. Numerous diagrams and illustrations form effective graphic expositions of the written text. The tone of the book is conservative. The physician who is too busy with his practice to keep abreast of the ever increasing literature of experimental physiology, but who desires to keep in touch with the standard physiological doctrines, will do well to refer to this book.

BACTERIOLOGY.

Pathogenic Microorganisms. By WILLIAM HALLOCK PARK, M. D., Professor of Bacteriology and Hygiene University and Bellevue Hospital Medical College and Director of the Bureau of Laboratories of the Department of Health, New York City, and ANNA WESSELS WILLIAMS, M. D., Assistant Director of the Bureau of Laboratories of the Department of Health; Consulting Pathologist to the New York Infirmary for Women and Children. Assisted by CHARLES KRUMWIEDE, JR., M. D., Assistant Director of the Bureau of Laboratories; Assistant Professor of Bacteriology and Hygiene in the University and Bellevue Hospital Medical College, New York City. Seventh Edition. Enlarged and Revised. Illustrated. Philadelphia: Lea & Febiger, 1920. Pp. iii-786.

This book is the outgrowth of the original first edition which was called *Bacteriology in Medicine and Surgery*. Since the publication of this unassuming first edition much progress necessitated many changes in the editions that followed. This, the seventh edition, presents new phases of the work done on media. Dr. B. v. H. Anthony has written the chapter and he has incorporated the work done on hydrogen ion concentration. Many other important chapters have been revised including those on streptococci, yeasts, and the influenza bacillus. The entire question of immunity is presented in a lucid and well written manner and this alone would commend the book to the practical worker. The nucleus of the book originated in the bacteriological laboratories of the city of New York. The authors have been successful in presenting the ordinarily dry subject of bacteriology in a way that is understandable and useful to the general practitioner.

THE ART OF PRESCRIBING.

L'Art de prescrire. Par le Professeur GILBERT, professeur de clinique médicale a l'Hotel-Dieu de Paris, Membre de l'Académie de Médecine. Paris: Librairie J. B. Baillière et Fils, 1920. Pp. x-373.

This book is no simple compilation, no mere cookbook collection, but is *L'Art de prescrire* and an attempt has been made to change this dry science and make it charming and attractive. Professor Gilbert, lecturer at the Hôtel Dieu, Paris, has been rendering the subject of prescribing interesting to his students for many years. The General Principles of Therapeutics is a fine, lucid exposition; this is followed by a chapter on official remedies, and their efficacy according to mode of usage, many warnings being given as to haphazard treatment. The patient is always considered as an individual first. The supplement has an historical note on the origin of recipe, on tables of solubility, and the incompatibility of certain drugs, and will be useful to those who do their own dispensing. He is wise on not going deeply into the question of psychical agents in such a book, but, as he says, every good doctor is unconsciously a psychotherapist. "The doctor's speech, his pious lies both help to raise the listless *morale* of a patient. The sound of his voice, his look, his smile, his mere presence bring joy and hope and favor a right action of the treatment he prescribes."

POSTMORTEM TECHNIC.

Postmortem Manual. A Handbook of Morbid Anatomy and Postmortem Technic. By CHARLES R. BOX, M. D., B. S., B. Sc., Lond., F. R. C. P. Lond., F. R. C. S. Eng.; Physician to St. Thomas's Hospital and to the London Fever Hospital; Late Demonstrator of Morbid Anatomy, St. Thomas's Hospital. Second Edition. Illustrated. London: J. & A. Churchill, 119. Pp. vi-372.

A concise, practical manual, dealing with the gross pathological changes to be found at autopsy. The descriptions of the various technical steps are of practical value and their observation would prevent the mutilation so often encountered, due largely to lack of training on the part of the operator. Many short cuts are given and these too should save time and energy. Many useful hints are scattered throughout the text. To take advantage of these would save many a tyro from embarrassing experiences. The simplicity of the style and the direct handling of the subject make it an easy book to study.

ARTERIOSCLEROSIS AND HYPERTENSION.

Arteriosclerosis and Hypertension. With Chapters on Blood Pressure. By LOUIS M. WARFIELD, A. B., M. D., (Johns Hopkins), F. A. C. P. Formerly Professor of Clinical Medicine, Marquette University Medical School, etc. Third Edition. Illustrated. St. Louis: C. V. Mosby Co., 1920. Pp. xv-265.

In no field of medical endeavor has more work been done than in the study of the baffling subject of hypertension and arteriosclerosis. As the author says: "Much that has been written on the subject is of little value." It is yet a bit early to determine just how much value there is to anything that has been written on the subject. The topics have been approached from many angles and much information

secured, but for the major part we are still very much in the dark. None the less we are obliged to make the most of the material we have at hand. Warfield has approached this complex subject with great candor and has only presented the findings of which he is reasonably sure. He has carefully avoided the presentation of the many involved theories which have been the ground of so much serious controversy and has clung to the pathways of empirical medicine. With fearlessness he has presented his own findings and these appear to be rational enough. Where he has lacked boldness, he has made up in good sense. Many will disagree with him but all will respect the sincerity with which he has given his findings to the medical profession. It is a comfort to find a book on any subject which is not a rehash of all that has gone before on the same subject. The technic of blood pressure observation during anesthesia at operation is simple and it seems as though this method should be used more generally as it is a valuable guide in operative procedures. Aside from this as an aid to research work valuable data could be obtained.

MANUAL OF ANATOMY.

Cunningham's Manual of Practical Anatomy. Revised and Edited by ARTHUR ROBINSON, Professor of Anatomy in the University of Edinburgh. Seventh Edition. In Three Volumes. Illustrated. New York: William Wood & Co., 1919.

There have been no changes in this standard anatomy since 1914. Three impressions were taken of the sixth edition which first appeared at this time. Many new changes and additions have caused the publishers to publish the book in three volumes in place of the usual two, Volume I includes the superior and inferior extremities; Volume II, the thorax and abdomen, and Volume III, the head and neck. As the book stands today it is considered one of the most valuable class room dissecting manuals.

CHRONIC DISEASES.

Origine, évolution et traitement des maladies chroniques noncontagieuses. Par J. DANYSZ. Paris: Librairie J. B. Ballière et Fils, 1920. Pp. vii-130.

For many centuries the list of incurable diseases was very long and a chronic invalid was accepted without question by the family: nothing was done except to render his battered tent as impervious to disease as possible. In fact, an invalid was supposed to exert a good moral influence by his patience in suffering and claim to self-sacrifice on the part of relations.

But inspired by success learned men no longer tolerate chronic maladies, but fight them, and among the cheerful hoppers of ultimate victory is Professor Danysz, of the Paris Pasteur Institute, whose studies have led him to the conclusion that all chronic morbid conditions, with their acute crises and more or less prolonged intermissions, have antigens as origin, and, as determining cause, the state of anaphylactic immunity of the organism. Experience has shown that antianaphylactic treatment has incontestable efficacy in all chronic maladies, except in purely mental ones, and even these are being effectively studied. Results have been obtained by

nonspecific antigens, to explain whose curative action the author and his collaborators have been forced to admit the direct and predominating intervention of the nervous centres on the curative reactions. There is a capital résumé, followed by an exposition of the general theory of immunity, anaphylaxis, and antianaphylaxis based on the structure, properties, the functioning of the organism, its structural units and the functions of which it is composed.

MEDICAL EXAMINATION OF AVIATORS.

Guide pratique pour l'examen médical des aviateurs, des candidats à l'aviation, et des pilotes. Par Le Dr MAUBLANC et le Dr. RATIÉ, médecins du centre d'aviation de Chartres. Préface de M. le Dr. ANDRÉ BROCA, professeur agrégé à la Faculté de Médecine de Paris. Illustrated. Paris: Librairie J. B. Ballière et Fils, 1920. Pp. vi-109.

In the beginning the airman's wings were pluck and experience. War made urgent demands: the men flew to fulfil them, but often came hurtling to the earth, bruised, dying, because of some little fault in their physical or mental condition.

The present year has brought time for a scientific examination of all government aviators, and few of them will be properly grateful to Maublanc and Ratié for their splendid guide, simply because much stress is laid not on present physical condition but on past history. Yet to men so highly placed as examiners, attention must be given. The apparatus they use admits of no argument on the part of the candidate, the wicked machine heartlessly records its findings.

They reject all who have had bacillosis long ago, or recently, pleurisy, scarlatina, articular rheumatism, syphilis, or malaria, wounds which have left functional impotence if this impairs them as pilots, slight cardiac lesions though there seem to be perfect compensation at the time of examination. All suffering from tuberculous affections, of whatever degree, must be rejected, also the dyspeptic, nephritic or enteritic. "Who then can be saved?" ask the rejected. We refer them to the excellent guide whose writers declare as their object the raising of the military status of aviators and bringing about that appreciation by the public now so heavily lacking.

NOW IT CAN BE TOLD.

Now It Can Be Told. By PHILIP GIBBS. Illustrated. New York: Harper & Brothers. Pp. iii-558.

During the long anxious years of the war we read with interest the dispatches of Philip Gibbs, correspondent. Some of us, the more or perhaps the less fortunate, who saw and felt some of the things he was writing about, realized at the time that he was telling the truth—that is, as much of the truth as could be told.

Now he has told us the story all over again. The officers who in the former dispatches were gallant men now have their stupidity revealed; they are no less gallant in the new picture but the picture is completed. We are told again of the heroism of raw recruits, how they stormed the trenches, and yet in their hearts they had no hatred for the much advertised Hun. He shows how similar in appearance the captured boys were to the boys who captured them; only by their uniforms could they be

told one from the other. He makes it seem as though they came from the same common stock, that they were brothers in more than appearance, settling the quarrels of short sighted rulers who followed old traditions which had long since become useless except as a means of perpetuating their own worthless class. The men tell us, in this document of Gibbs's, that they did not want to kill Germans. They had no quarrel with them and they didn't like the work of butchery.

He shows how in the actual combat the men were swept off their feet and the lust for killing arose in them in an atavistic fashion. The men harked back to the old barbarities; the old savage, sadistic instinct came to the fore; they went back to their archaic past, to their embryonal, infantile state. We see how the propaganda of blood curdling tales of cruelty, tales from Belgium of children's hands cut off, old men murdered, and women violated, sent the men hurrying to the army. We now see the unraveling of the red tape of the staff and the suffering red dawns with the closing red toll. And we better understand the fear the censor had in not allowing the truth to be told; a fear of their own people, not of the enemy, for the enemy knew. In a graphic way we are made to realize by a few cold words how the old professional army came to die and how modern warfare opened the battlefield to the multitude. There could no longer be a group watching the paid gladiators. . . . If there must be war then they must all share in its sacrifices. . . . There would have to be victims as well as victors. Names appear, spelled in full, initials included, and the owners are given full credit for their sins, both of omission and of commission. No one escapes in this fearless telling, not even the commander in chief of his own army—the British.

It took courage to tell the story and it has great value, for no one can doubt the authenticity of an accredited man like Gibbs. He was there. He saw it and now when we can sit back in a relaxed frame of mind we will do well to hear what he has to tell.

It may be said that we are weary of war and stories of war, but we who were through what some are pleased to call the great adventure, see it in another light. We can more truly call it the great crime, or many more harsh sounding names. It may be that we have had enough war. We did have a great deal of it and it was a bit of a war—but too little has been told—too little of the truth. The books have told us more of the heroics and less of the cold, beastly, mechanical grind of the whole maniacal business. Too little of the diabolic mess and too much of the heroes. The more we read of true stories such as this the less war we will have to write about in the future.

This book will take its place with Zola's *Downfall*, Andreyev's *Red Laugh*, Barbusse's *Under Fire* and Latzka's *Men in War*.

Gibbs is bitter in his denunciation of militaristic intervention in Russia. He states that England and France stood by when the old Tzardom with which they had allied themselves committed every type of cruelty against a helpless people, and when these people founded a new order, which was more dangerous to the old order than high explosives, they attempted to crush their newly won liberties. He

tells how the French mutinied and how the British soldiers themselves would not go to Russia.

The beauty and truth of his closing lines allow for their repetition. "Now let us exorcise our own devils and get back to kindness toward all men of good will. That also is the only way to heal the heart of the world and our own state. Let us seek the beauty of life and God's truth somehow, remembering the boys who died too soon, and all the falsity and hatred of these past five years. By blood and passion there will be no healing. We have seen too much blood. We want to wipe it out of our eyes and souls. Let us have Peace."

SCIENCE IN FICTION.

The Golden Scorpion. By SAX ROHMER. Illustrated. New York: Robert M. McBride & Co., 1920. Pp. v-308.

The writers of stories of mystery and crime in 1920 do not meet such responsive thrills as heretofore. The improbabilities of an earlier age are probabilized. Verne and Haggard would be certified as sane by any alienist, and so eager are writers to show their prescience that they despise the steady radiance of accepted science and pen their stories by the as yet uncertain light of marvels to be revealed.

But, on the whole, we are grateful to Sax Rohmer and his kind for leading us away for awhile from those facts "which every woman—every man should know," and introducing us to *The Golden Scorpion*, whose real name is Fo-Hi and who is so intimate with radium and really scientific methods of getting rid of enemies. There is a doctor, too, superhuman in his knowledge of poisons, human in his knowledge of women, and triumphant in saving the heroine Miska from the fiendish Fo-Hi. We are rather sorry when "there came a flash of blinding light, an intense crackling sound, the crash of broken glass, and a dense cloud of pungent fumes rose in the heated air," because that means the story is finished. "The complete and instantaneous disintegration (of Fo-Hi) had taken place," the marvelous suicide resulting from his researches.

THE ETERNAL QUESTION.

Women's Wild Oats. Essays on the Refixing of Moral Standards. By C. GASQUOINE HARTLEY. Author of *The Truth About Women*, *Motherhood and the Relationships of the Sexes*, etc. New York: Frederick A. Stokes Company, 1920. Pp. vii-227.

Over two thousand years ago, three young men of the Persian Royal Guard were keeping watch one night in the King's antechamber. There had been a banquet that night; plenty of wine and beautiful women, and perhaps they found it difficult to keep awake, so to pass the time they got up a competition. They would each write on a piece of paper that which they esteemed the strongest thing in the world and put the slips under the King's pillow. In the morning he would find them, and, to the wisest writer he would be asked to accord the award—an award of privileges and gifts.

But, when they were read, King Darius sent for the royal staff and said the young men should defend their own statements and those of the Court should decide. The first had written: "Wine is the strongest." The second, "The King is the strong-

est." The third, "Women are the strongest, but, above all things, Truth beareth away the victory."

Each statement was eloquently defended," and the King and the princes looked one on another perhaps approvingly) for women had a good advocate, but suddenly the defender boldly said, "Wine is wicked, the King is wicked, women are wicked. . . . as for the Truth, it endureth and is always strong: it liveth and conquereth for evermore." A bold statement, when it was not wise to displease a King and pretty ladies were influential at court and delighted then, as now, to bewitch men with their "tinkling ornaments, chains and bracelets and ornaments, changeable suits of apparel, mantles and wimples and crisping pins," and the Piccadilly and Broadway ladies of those days lurked in dusky corners to beguile young men at night. There was a moment's silence, then a mighty shout went up from all present. The speaker had a Kingly kiss and cousinship bestowed, and far more—politically—than he had dared to hope.

Gasquoine Hartley is one of a large throng who are earnestly trying to write the wisest thing. She has studied women all through the ages, and, while admitting that education, suffrage, larger views, and war times have changed woman's position and relegated many oldfashioned views to the lumber room, her descriptions and opinions as to moral worth might be embodied among those of prophets and reformers thousands of years ago.

But she frankly admits that old world cures will not cure, and has plenty of sympathy for the new girl. She deals ably with the question of woman's fitness for work, for her home duties, her attitude toward marriage and lover, the unmarried mother and the love child, divorce, and platonic attachments. The young guardsman who won the royal kiss also spoke frankly concerning the ways of women. What does the author suggest? It is hardly fair to pick out sentences without giving the context, but a few gleanings may draw more attention on the part of readers to a closer study of the whole.

"There are many without the gifts that make for successful parenthood or happy permanent marriage. I would recognize this frankly and let those who do not desire marriage be openly permitted to live together in honorable temporary union . . . those who do not want children and, not wishing the bondage of continuous companionship, desire to pass their lives in liberty."

"The essential fact in every relationship of the sexes is the woman's power over the man, and it is the misuse of that power which leads to all prostitution. For the lust, men are held responsible: the chaste character of women held up in contrast! This view gives women all the pleasing satisfaction of a virtue that is realized without effort and explains why they object to repressive measures.

If we inquire into this question of men's lust, it is obvious that not they, but women, are the more responsible. Man's lust is a necessity to her very existence. She is the controller of the assault."

The foolishness of allowing the fallen girls to bring up their babies, and of continuing in un-

happy wedlock all have stormy comments. Again we ask with her, "What is the cure?" but, unlike her, we shout "Truth is the strongest." People do not abuse the moribund. The still active, open hostility to vice exposure or to changing customs shows vigilant interest, an undying interest, for, as far back as written pages tell us, zealous men have found that women are decadent, rapidly going to the devil, enemies of men, and in no age have been as bad as the present (their own day). A sorry lookout for the men, seeing that woman stands at the very gate of Life and all men must humbly enter by her permission.

Meanwhile sex literature is flooding the market. It is a case of "secrets known to all," but, to our mind, the life, not the writing, of one good, open minded loving woman deters more girls from evil than any amount of books. No antivice remedy will be curative when administered in the septic, battered spoon of pessimism. Good is stronger than evil. Wine is strong, the King is strong, women are strongest, but, above all things, Truth beareth away the victory."

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

THE LIGHT HEART. By MAURICE HEWLETT. New York: Henry Holt & Co., 1920. Pp. xii-188.

THE PROBLEM OF NERVOUS BREAKDOWN. By EDWIN LANCELOT ASH, M.D. New York: The Macmillan Company, 1920. Pp. xii-299.

THE JOHNS HOPKINS HOSPITAL REPORTS. Volume XIX. Illustrated. Baltimore: The Johns Hopkins Press, 1920. Pp. i-358.

BACKWATERS OF LETHE. By G. A. H. BARTON, M.D., Anesthetist to the Hampstead General and Royal National Orthopedic Hospital, etc. Illustrated. London: H. K. Lewis & Co., 1920. Pp. v-151.

OUR GREAT WAR AND THE WAR OF THE ANCIENT GREEKS. By GILBERT MURRAY, LL.D., D.Litt., F.B.A., Regius Professor of Greek in the University of Oxford. New York: Thomas Seltzer, 1920. Pp. v-85.

BY-PATHS IN HEBRAIC BOOKLAND. By ISRAEL ABRAHAMS, D.D., M.A., Author of *Jewish Life in the Middle Ages*, *Chapters on Jewish Literature*, etc. Illustrated. Philadelphia: The Jewish Publication Society of America, 1920. Pp. v-371.

ADULT AND CHILD—HOW TO HELP, HOW NOT TO HINDER A STUDY IN DEVELOPMENT BY COMRADESHIP. By JAMES L. HUGHES, LL.D., for forty years Inspector of Schools in Toronto. Author of *Mistakes in Teaching*, *How to Secure and Retain Attention*, etc. Syracuse: C. W. Bardeen. Pp. ix-187.

HEREDITY AND ENVIRONMENT IN THE DEVELOPMENT OF MEN. By EDWIN GRANT CONKLIN, Professor of Biology in Princeton University. Second Printing of Revised Third Edition. Illustrated. Princeton, N. J.: Princeton University Press. London: Humphrey Milford (Oxford University Press), 1920. Pp. xv-361.

THE HUMAN COSTS OF THE WAR. By HOMER FOLKS, Organizer and Director of the Department of Civil Affairs of the American Red Cross in France and later Special Commissioner to Southeastern Europe. Illustrated with Photographs by LEWIS W. HINE, American Red Cross Special Survey Mission. New York and London: Harper & Brothers. Pp. i-326.

Practical Therapeutics and Preventive Medicine

A Compendium of Treatment and Prophylaxis, Original and Adapted

Surgical Intervention in Severe Forms of Dysentery.—Jacques Leveuf and Georges Heuyer (*Paris médical*, April 10, 1920) state that in acute gangrenous dysentery associated with grave symptoms, immediate rest for the ulcerated intestine by surgical means is indicated. Diverting the course of the fecal flow also permits of intensive feeding and of bringing about direct remedial action on the colonic lesions through appropriate lavage. A broad cecostomy opening, readily made and constituting a harmless operation, answers the requirements and yields highly gratifying results. In chronic cachectic dysentery—essentially a protracted gangrenous dysentery—the same indications obtain; the main aim should, however, be to prevent such a condition by insisting upon early operation. In cases of dysentery distinctly improved by ordinary measures but not cured within a reasonable time, appendicostomy followed by intestinal lavage is a useful adjunct to the medical treatment. Cecostomy should be considered an emergency operation, having precise indications which hardly permit of temporizing. Appendicostomy brings to medical treatment the added assistance of the direct action of lavage on the proximal portion of the colon.

Treatment of Acute Intestinal Intoxication with and without Acidosis.—J. S. Weitzel (*Virginia Medical Monthly*, March, 1920) states that in the acute intestinal intoxication of young children, prevalent during the summer and early fall months, an initial dose of two to four drams of castor oil should be given unless there is persistent vomiting, in which case sodium bicarbonate should be begun at once and given in sufficient doses to keep the urine alkaline. If, however, the bowels have been very active and only serum and mucus are being evacuated, the initial cathartic is unnecessary. If vomiting continues after administration of sodium bicarbonate, one or more stomach washings with bicarbonate solution will usually allay it. A colonic irrigation of warm saline solution once or twice a day proves highly beneficial in these cases. But little pressure should be used, and the tube should be inserted for a distance of four or five inches. Bismuth subcarbonate, ten grains every three hours in children under six months of age and every two hours after six months, until some astringent action is noticed, is occasionally beneficial. Paregoric should be used only to relieve tenesmus or when large watery stools persist, and should not be given in doses large enough to produce stupor. In cases with severe prostration, brandy, caffeine sodiobenzoate, and camphor in oil are satisfactory stimulants. When acidosis arises, sodium bicarbonate must be given promptly, either by mouth, subcutaneously, or intravenously. By mouth, fifteen to thirty grains every two hours should be given until the urine is alkaline, and then enough to keep it alkaline. Subcutaneously a two per cent. solution, and intravenously a four per cent. solution, are

used. Boiling of the solution during its preparation must be avoided. The intravenous method in infants with an open fontanel is very satisfactory, and is simplified by use of the Goldbloom needle for injection into the longitudinal sinus. In severe forms in which the intake of water is greatly reduced and the tissues become relatively dry owing to the frequent watery stools, intraperitoneal administration of normal saline solution is the most efficient corrective procedure. A spinal puncture needle is inserted through the abdominal wall in the linea alba, one half inch below the umbilicus, and the warm saline allowed to flow in by gravity to the amount of seventy-five to 150 mils, according to the size of the child. The procedure is repeated daily until the tissues lose their dry, parched appearance and the doughy consistency of the abdomen disappears. After the initial rest of the stomach, protein milk should be used to feed the child.

Late Results of Appendectomy for Chronic Appendicitis.—Enriquez (*Bulletin de l'Académie de médecine*, March 16, 1920) asserts that in over one fourth of all cases, appendectomy for chronic appendicitis fails to benefit the patient. Surgeons have often found, in addition to appendiceal disease, such conditions as adhesive pericolicitis, more or less pronounced omental inflammation, cecum mobile, and kink of the distal loop of the ileum. Often constipation is more obstinate, painful attacks more frequent, and nausea a more marked feature, than before the operation. In one group of cases there is pronounced impairment of the general condition, with anemia and slight vesperal fever, ultimately ascribed, as a rule, to a latent pulmonary or lymphatic tuberculous process. Spontaneous pain, or pain induced by certain postures, radiates toward the umbilicus, liver, or right lower extremity. Tenderness is greatest between the operative scar and the umbilicus, and palpation may give the impression of rigidity, a cord, or even a tumor in this region. In a second group of cases fever is wanting, but digestive symptoms are more marked, viz., late pains and eructations, and constipation interrupted by mucomembranous diarrhea, occurring in attacks preceded by severe headache. To forestall such attacks the patients reduce their diet and ultimately pass into inanition, with the accompanying asthenia, depression of spirits, and hypochondria. General visceroptosis is the rule in these cases, with gurgling in the cecum and painful spasm of the descending colon. Radioscopy yields definite findings in these two groups of cases. In the first, the stomach is tonic or hypertonic, and its axis no longer vertical; the hepatic flexure is drawn toward the midline; the ascending and transverse colons are in apposition; the lower portion of the cecum fails to ascend in the horizontal posture, and there is delayed evacuation of the ileum. In the second, the stomach is hypotonic or atonic; there is coloptosis; the cecum is very movable, and the Lane kink is present. In

the first group the disturbance is mainly inflammatory; in the second, mainly mechanical. In both instances the blood shows a leucocytosis of 10,000 to 14,000; the large mononuclears are increased to ten to fourteen per cent., and the eosinophiles, to three to eight per cent. The main difficulty is that heretofore chronic inflammation of the appendix has been regarded as constituting practically the whole of the pathology of the right iliac fossa. The remedy is routine x ray examination, which will reveal the various coexisting lesions requiring special surgical procedures if recovery is to be obtained. The physician should himself be present during the radioscopy, and not rely on plates alone. Examination in both the standing and the recumbent postures are essential. In operating the surgeon should make incisions sufficiently long to permit of the necessary exploration of the ileocecal region, cecum, hepatic flexure, and omentum. Where the symptoms suggest a gallbladder, pyloric, or duodenal lesion, the McBurney incision may be advantageously replaced by Walther's median incision, or better, the transverse supraumbilical incision employed by Gosset.

Enterostomy for Postoperative Intestinal Obstruction.—A. S. Brinkley (*Virginia Medical Monthly*, February, 1920) emphasizes the harm done by extensive operative manipulations in these cases and recommends, instead, enterostomy through a small incision under local anesthesia. Morphine is given hypodermically half an hour before the operation, a McBurney incision usually made, and one half of one per cent. novocaine solution used to infiltrate the tissues. After thorough infiltration of the preperitoneal fascia the peritoneum is incised and a quick exploration carried out with the middle and forefingers to locate if possible the point of obstruction. Then a loop of intestine nearest this point on the proximal side is brought up and an enterostomy done on the principle of Coffey, viz., of forming a valve of the intestinal mucosa. After packing around the loop with gauze moistened in saline solution, an incision about two inches long is made with a sharp knife down to the mucosa. A purse string suture of linen is placed at one end and the mucosa within the grasp of this suture punctured. A soft rubber catheter is quickly inserted through the puncture, the purse string tied snugly, an end of the suture threaded in a sharp needle, and the catheter transfixed and held in place. The portion of the catheter over the incision is then buried with a right angled suture. The bowel is sponged off with saline sheets and returned to the abdomen, and the wound closed with interrupted through and through silkworm gut sutures. The catheter stays in position at least five or six days, and when it is removed there is little or no leakage of fecal contents; the mucous membrane is thin, pours out but little plastic exudate, acts readily as a valve, and tends to close the opening. Gastric lavage with soda solution is ordered every four to six hours until no longer indicated. Saline solution with glucose and soda is given by rectum every four hours. Hypodermoclysis is also practised and caffeine sodiobenzoate or digalen given if the heart action is not good. The catheter is connected with a longer tube and the drainage collected in a bottle

tied to the bed rail. Every two or three hours the catheter is disconnected from the longer tubing and about one ounce of warm water is injected into the bowel, to keep the catheter open. All feeding is withheld for at least forty-eight hours, then liquid nourishment given every two hours for the next five or six days. Mineral oil, one ounce three times a day, is started on the fifth or sixth day, and enemas given according to indications. The catheter could usually be removed in five to seven days, but the author leaves it in for ten days. Three cases of postoperative intestinal obstruction dealt with by this method are reported. All the patients recovered and left the hospital in from three to six weeks after the operation. One of the patients was a woman seventy years of age.

A New Vehicle for Emetine Bismuthos Iodide.—T. J. G. Mayer (*Journal of Tropical Medicine and Hygiene*, May 1, 1920) states that he has found a new vehicle for this compound which will pass through the stomach unchanged and be digested by the intestinal juices. The drug is rubbed up with sixteen parts of mutton fat, the mass moulded into rounded pills weighing about seven grains, and each pill covered with a layer of mutton fat, applied with a paint brush. The mutton fat being solid at body temperature, it is not digested until it is too far beyond the pyloric orifice to be regurgitated and cause vomiting or even nausea. Pills containing one and a half grains of the drug and about seven and a half grains of mutton fat are about as large as may be conveniently swallowed. Two were given each night for twelve consecutive nights. The pills were kept in the ice chest but the addition of thymol might serve instead as preservative. That the emetine bismuthos iodide was altered by the intestinal juices was shown by the discoloration of the feces and the cure of the dysentery.

Kaolin as a Substitute for Bismuth Subnitrate.—Hayem (*Bulletin de l'Académie de médecine*, April 13, 1920) states that while bismuth subnitrate taken on an empty stomach in the morning in a single large dose of twenty grams is the remedy par excellence for gastric pain of any variety, and is free from the risk of alkalinophagia which attends the use of sodium bicarbonate, a salt of good quality is now hard to obtain, and the price of bismuth salts has so increased as to render them unavailable to a large proportion of patients. In 1915 he tried kaolin as substitute in a case of gastric ulcer, and found it so satisfactory that he has more recently been using it in all the varieties of cases in which the bismuth salt is generally given. The kaolin as administered is an impalpable powder consisting of silica, alumina, and the oxides of iron and magnesium. It is practically insoluble in water and the organic fluids. Well washed kaolin is almost tasteless and may be given with water like bismuth. The same dose is used. As kaolin is somewhat lighter, at least a half hour should be allowed to elapse after the dose before breakfast is taken. To provide a pleasant flavor, one half drop of oil of anise may be mixed in each twenty gram powder of kaolin; or, one third drop of oil

of peppermint may be used instead. Like bismuth subnitrate, kaolin acts as a disinfectant and deodorant to the stools; in fact, it is even preferable to bismuth in its effects on the bowel, tending to allay intestinal disturbances and regularize intestinal action. It should not be looked upon as a complete substitute for bismuth subnitrate, as its effects are less regular and sustained. It is, however, remedially sufficient in many cases. Internal use of kaolin has already been recommended by others in Asiatic cholera and chronic diarrhea, but the writer claims priority in pointing out its property of relieving pain, as well as of acting as disinfectant, in gastroenteropathic patients.

Gastric Secretions in Neurocirculatory Asthenia.—John H. Musser (*American Journal of the Medical Sciences*, May, 1920) says that in patients suffering with neurocirculatory asthenia there is a very definite increase in the total acidity and free hydrochloric acid as compared with controls. These figures do not represent abnormal hyperacidity, but they do show that almost uniformly soldiers suffering from neurocirculatory asthenia as contrasted with apparently normal soldiers, both eating the same food, under identical routine and under the same conditions of living, show a higher gastric acidity. This is a diagnostic point which may be of value in differentiating the disorder in questionable cases. It surely seems to add further evidence to that already accumulated that these soldiers are suffering from a neurosis with which is probably associated a hyperirritable agus.

Percussion in the Detection of Tender Points in the Abdomen.—G. Hayem (*Bulletin de l'Académie de médecine*, February 24, 1920) emphasizes the necessity of establishing a clear clinical distinction between pain and tenderness in abdominal disorders. Induced pain is a better term than pain upon pressure, for tenderness may be elicited by means other than pressure. The author uses special percussion hammers with gauges showing the force of each blow delivered, from fifty up to 1,000 grams. When the customary tender points are tapped with this hammer, patients with abdominal disorders are found very sensitive to the procedure. Sometimes even very light percussion will bring out tenderness at points previously found insensitive to firm pressure; this occurs especially in cases in which the abdominal muscles are contracted. In gastropathic patients the tender points are nearly always the same. One is situated on the linea alba, somewhat nearer to the xiphoid than to the umbilicus. One or two other sensitive points along the linea alba are not infrequent, and such points should also be examined for both to the right and the left of this line. Sensitive points can often be detected along the right costal margin, but are exceptional on the left side. In many patients apparently free of intestinal disorder, and even oftener in those actually suffering from such disorder, percussion over the colon is more or less painful, especially over the cecum, transverse colon, and sigmoid. Tenderness to percussion or pressure is sometimes of neurotic nature, and may relate to a dermatalgia or neuralgia—with or without central neurosis. It may

also be of muscular origin. Generally, however, it results from organic disturbance. Most recent authors ascribe it to sensitiveness of the abdominal nerve plexuses, but it is actually difficult to exert effective pressure on these plexuses, and under ordinary circumstances, especially when percussion is used, the pain induced can only be visceral in its location. At the point of election above the umbilicus the tender point may be situated in the peritoneum, the liver, or the stomach wall at the lesser curvature. Aside from ulcer and cancer cases, the ordinary pain of dyspeptics is probably in most instances localized in the liver, at least, pain on percussion is elicited nearly always over the portion of the liver covering the upper portion of the costo-umbilical triangle. Since tender points are often found simultaneously along the right costal margin and along the course of the large bowel, it seems justifiable to conclude that in chronic gastric affections remote reaction upon the liver and bowel is a frequent accompaniment.

Results of Operations for Chronic Appendicitis.—Charles L. Gibson (*American Journal of the Medical Sciences*, May, 1920) recommends the following in order to avoid disappointing results, basing the suggestions on a study of 555 cases: 1. A comprehensive and detailed history. 2. A complete and thorough physical examination, including all refinements of diagnosis. 3. Exercise caution in undertaking operations on women as compared to men. 4. Exercise caution, particularly in the more mature patients, particularly women; in this class other lesions may coexist or may be mistaken for appendicitis. 5. Avoid the neurasthenics of any age or sex. 6. Exercise particular restraint when there is no clear and reliable history of well defined attacks, particularly of localized pain accompanied by nausea and vomiting. 7. Make a good sized incision, and, even if a frankly pathological appendix is found, look for other possible lesions. 8. If no obviously pathological appendix is found, do not cease looking for other lesions until every other possibility has been exhausted.

The Calorie as a Unit in Figuring Milk Modifications.—Tracy Jackson Putnam (*Boston Medical and Surgical Journal*, January 29, 1920) asserts that the method of calculating milk modifications according to the absolute caloric values of the respective food elements is as rational as the present methods of calculation by percentage composition and volume, or by total caloric value. The use of the calorie as a unit in expressing the composition of milks is of advantage in that all food elements are reduced to a common standard. Such a view of infant's diet, he thinks, might lead to a clearer comprehension of the subject by some practitioners. It would allow of easy manipulation of the fluid volume apart from the food value of various mixtures, and might lead to the accumulation of more data concerning the effects of alterations in fluid volume, and would facilitate the extension of the calculation of the diet into late infancy when desirable. He believes that the calculation of modifications would be simpler in many ways, and more easily understood, than many of the present systems.

Miscellany from Home and Foreign Journals

Acidosis in Acute Abdominal Disorders.—M. Lablée (*Bulletin de l'Académie de médecine*, April 6, 1920) maintains that acidosis is a condition of broad clinical interest and value and should be systematically investigated in all patients, like albuminuria and glycosuria. He is in the habit of applying the Gerhardt, Legal, and Lisben tests for this purpose. While relatively uncommon in the major acute infections, acidosis is frequently present in acute inflammations of the abdominal organs, e. g., in appendicitis, cholecystitis, salpingitis, etc. In appendicitis of intermediate severity or with peritonitis it is present in a majority of cases during the acute stage, disappearing after a few days but recurring if a relapse occurs. It is particularly marked in some cases without very high temperature but with probable involvement of the liver. The same condition appears in salpingoophoritis with pelvic peritonitis, and especially in cholecystitis and pericholecystitis. Fasting, operative trauma, and anesthesia are not important factors in the acidosis in such cases. Its main cause is functional disturbance of the liver secondary to the infection. Evidences of hepatic insufficiency generally coexist with the acidosis. Generally there is an intense urobilinuria, which dwindles and disappears along with the diaceturia. With H. Bith, Labbé found ammoniuria and aminoaciduria in cases of appendicitis, even in the presence of slight acidosis. In a case of abdominal infection during pregnancy and in one of fatal acute hepatic insufficiency in a pregnant woman, he found in conjunction with positive acidosis tests, a marked aminoaciduria and all evidences of insufficient proteolytic activity.

Chronic Digestive Disturbances in Gas Poisoning Cases.—Maurice Loeper (*Bulletin de l'Académie de médecine*, March 2, 1920) states that poisoning with chlorine or mustard gas causes chronic digestive disturbances oftener than poisoning by pallete or benzyl bromide. Such disturbances are met with in about six per cent. of the chlorine and mustard gas cases. The flatulent type of disturbance is characterized by anorexia, gas accumulation, discomfort soon after taking food, and aerophagia; the painful type, by late pains and symptoms generally suggestive of pyloric disease. The chief pathological disorder produced is probably a pyloritis. There is often salivation, nausea, and vomiting. Either hypochlorhydria or hyperchlorhydria may be present, the former due apparently to deep initial involvement, with mucous atrophy, and the latter to more superficial disturbances, with secretory functional reaction. That the condition is a gastritis and not a simple dyspepsia is confirmed by cytological examination of the stomach contents. In one form, such examination reveals a marked desquamative gastritis; in the other, the presence of large numbers of polynuclear leucocytes or lymphocytes, indicating a persistent infection of the mucous membrane. The epithelial desquamation often coexists with increased gastric acidity; the diapedesis, with lowered acidity. These local changes produce secondarily

an abnormal sensitiveness of the abdominal nerve plexuses, low blood pressure, disturbances of cardiac rhythm, and variations in the oculocardiac reflex. Tenderness occurs not only in the celiac region but also in the superior and inferior mesenteric and the iliac regions. The pulse is often slowed, or may be irregular and with premature beats. Pathological studies showed in three cases the presence of microscopic hemorrhages in the stomach wall nine, twelve, and sixteen months, respectively, after the poisoning. No true ulcer was seen, but two cases showed permanent deformity of the greater curvature, and one case, partial stenosis of the pylorus—all ascribable to the marked lesions induced at the onset.

Gastrointestinal Service in an Army Hospital.—John A. Kantor (*Military Surgeon*, May, 1920) states that too pessimistic an impression as to the capacity of dyspeptics to qualify as fighting men is by no means justifiable. Now that such evidence is available, more than one ex-soldier will bear witness that his dyspepsia disappeared almost completely during his period of service. There is indeed no way of telling in advance in many an instance whether the disability is such as to be benefited or aggravated by military duties. The policy pursued in the recent mobilization of assigning trained men as gastroenterologists to the various base and general hospitals is decidedly to be recommended. Such men can readily build up special services that will be properly equipped to dispose adequately of all cases showing digestive disturbance. By this means much time can be saved in the weeding out of the absolutely unfit, the distribution of the moderately disabled to restricted duties, and the cure of those suffering from transient disorders.

Diverticulitis.—G. G. Turner (*Lancet*, January 17, 1920) reports several cases of diverticulitis, one with so great a thickening of the intestinal wall that a new growth was diagnosed at operation; another at the sigmoid flexure with a similar hyperplasia of the gut wall and a perforation just above it through which a large gallstone had ulcerated, and a third in which a very small almost isolated diverticulum had perforated producing a peritonitis. The etiology is considered by this author to be congenital. The diagnosis must be made on a history of repeated inflammatory attacks extending over long periods. This will help in differentiating from new growth after the inflammation has produced the thickened tumorlike mass palpable through the abdominal wall. As for treatment, the writer has had success with temporary colotomy to rest the bowel, with subsequent resolution of the inflammatory process so that the colotomy wound was closed and the lower part of the gut was able to function again. He has also inverted the projections converting them into polypi, with satisfactory outcome. It is important to keep the bowels regular and to have the patient stop eating when symptoms develop, if medical treatment is used.

Congenital Anomaly of Duodenum.—Leonard Freeman (*Surgery, Gynecology and Obstetrics*, May, 1920) states that partial occlusion of the duodenojejunal angle, simulating pyloric obstruction, occasionally occurs from the persistence of a condition normally existing in fetal life. In this, the duodenum, instead of appearing in the abdominal cavity from beneath the transverse mesocolon to the left of the spine, as it should, emerges to the right, its transverse and ascending portions possessing a peritoneal covering and mesentery of their own, similarly to the rest of the small intestine, instead of being fixed in fibrous tissue, as is normally the case. At the duodenojejunal angle, however, the bowel is hung up to the root of the colonic mesentery by a firm adhesion (duodenal fold of fetal life), the kink thus produced being intensified by the downward pull of the free duodenal loop. This kink is deeply situated and in freeing it care must be taken not to injure the bowel, the inferior mesenteric vein or the left colic artery. A considerable denudation of the gut may be necessary, which should be covered either by reuniting the peritoneum or by means of a free omental graft.

Nonrotation of the Colon.—Dudley Roberts (*American Journal of Surgery*, June, 1920) discusses the association of obscure abdominal symptoms with nonrotation of the colon and presents his conclusions as follows:

1. It seems probable that the anomaly is not as rare as might be inferred from the scarcity of literature. The condition is easily overlooked even at operation and many of the cases have not been reported.

2. Failure to locate the cecum in its usual site should immediately arouse a suspicion of nonrotation especially if small intestines present themselves in the right iliac fossa. Most frequently the cecum will then be found low down in the midline, even in the pelvis. Less frequently it will be found high in the middle of the abdomen, under the liver or in the left iliac fossa.

3. Left sided or midabdominal pain with symptoms suggestive of appendix inflammation suggests the advisability of a röntgen examination which will positively demonstrate the site of the cecum.

4. Erroneous conclusions may be reached in a röntgen study of these cases, particularly if the failure of rotation is only partial and the cecum is found on the right side of the abdomen. If the end of the cecum is seen pointing upward or inward the inference might be drawn that one is dealing with a lesion and not an anomaly.

5. The fact that sixteen cases out of twenty-two collected from the literature showed appendix inflammation associated with symptoms regarded as sufficient to justify operation suggests that nonrotation increases the natural predisposition to pathological conditions in the appendix. While this is not a proposition that can be proven it tends to justify the inference that we are dealing with an abnormal appendix when in a proven nonrotation case there are obscure abdominal symptoms. Certainly exploration of the appendix should be performed even if another incision is required for the purpose.

Letters to the Editors.

MORPHINE POISONING.

BROOKLYN, April 28, 1920.

To the Editors:

The recent report in the newspapers that a boy had died from the effects of swallowing morphine recalls a case which came to my notice forty years ago and which shows that morphine poisoning need not be fatal if the proper remedy is applied.

A physician who wanted to commit suicide gave himself 120 subcutaneous injections of one sixth grain of morphinum sulphurium each, or a total of twenty grains. He was soon found in a comatose condition, and a physician was immediately called. He sent for three others, among whom I was one. As morphine kills by paralyzing the respiratory centres, we at once undertook artificial respiration. We first removed the patient's clothing and two of us, one standing on each side, effected inspiration by the usual method of raising the arms high above the head, and expiration by lowering them and pressing them firmly against the thorax, the other two of us resting in the meanwhile. The patient's pulse was a little weaker and slower than normal. We had no time to take the blood pressure or make other observations. The only symptoms other than the lack of respiration were the contraction of the pupils—greater than I had ever seen before—and, of course, complete muscular paralysis. Occasionally we would stop for a few seconds to see whether he could breathe by himself, but he could not. Only after we had worked over him for eight hours did respiration begin, and then irregularly. After an hour more of partial continuation of our work he breathed fully and regularly, opened his eyes and spoke. He soon recovered completely, and after some weeks took up his practice again. His case indicates that the mortal effect of morphine is but a paralysis of the respiratory centre.

OSWALD JOERG, M. D.

Births, Marriages, and Deaths.

Died.

ARNOLD.—In Mexico, on Monday, June 14th, Dr. G. D. Arnold, of Cleveland, Ohio, aged seventy-six years.

CHAGNON.—In Brooklyn, N. Y., on Tuesday, June 22nd, Dr. Thelesphore Chagnon, aged sixty-one years.

DECK.—In Herkimer, N. Y., on Sunday, June 13th, Dr. Otis H. Deck, aged fifty-six years.

LYON.—In New Haven, Conn., on Monday, June 14th, Dr. Treby W. Lyon, aged thirty-nine years.

MCCARTHY.—In Malden, Mass., on Tuesday, June 22nd, Dr. Charles Daniel McCarthy, aged sixty years.

STONE.—In Frederick City, Md., on Sunday, June 13th, Dr. Daniel E. Stone, of Emmitsburg, Md., aged forty-four years.

WELLS.—In Trenton, N. J., on Friday, June 11th, Dr. Joseph M. Wells, aged sixty-three years.

WOOD.—In Bridgeport, Conn., on Wednesday, June 16th, Dr. Eugene H. Wood, aged sixty-three years.

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Original Communications

CHRONIC INTESTINAL TOXEMIA.*

A Study Based on One Thousand Cases.

BY ANTHONY BASSLER, M. D.,
New York.

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and New York Polyclinic Medical School and Hospital.

It gives a feeling of satisfaction to have worked on a subject in any of the learned sciences and then to see an awakening of interest in it even though this may take years to come about. Ten years ago no work worth while was being done on intestinal toxemias. A paper of mine at the time (1) received no recognition until recently, and now many men are at work on a subject that unfortunately is far from simple and requires much careful study. There have been debates back and forth, definite attitudes for and against certain aspects of the subject, but the consensus of belief of the best workers, is that such conditions exist, and that food and bacteria make up the important etiological factors in their production and therapeutics. These may have been my beliefs for the past ten years, during which time many cases have been diagnosed and treated on these bases. The clinical material comprised in all of these cases is too voluminous from which to make deductions, so, the last thousand cases have been taken and the best possible brief deductions made from them.

As pointed out by me, chronic excessive intestinal toxemias should be divided into two main groups, primary and secondary. The secondary are those that are due to intestinal anchorings from adhesions or bands, angulations, ptoses, specific infections within the gut in which the toxemia is part of a mixed infection (such as tuberculosis, syphilis, streptococcal infections of the buccal or nasal cavities, typhoid carriers), parasitic conditions, advanced age, neglected routine of life, habitual constipation, and other conditions. Some of these patients may require surgical treatment, others medical treatment. It is in the secondary toxemias that surgery often plays an important part, not the sort of surgery that Lane advises, but such surgery as is logical and safe. I do not believe that a chronically diseased appendix ever causes a secondary toxemia, because it is the toxemia that causes the disease of the appendix, and almost the same thing may be said of the gallbladder, but not

so definitely. I am of the opinion that colitis, whether sectional or general, has four causes, more or less mixed in parts, in all cases. These are unfortunate heredity and improper early life, endocrine disturbance, a neurological tendency, and a chronic intestinal toxemia. Such conditions always demand medical treatment and while conservative surgery may be required to do away with conditions that come secondarily, this is often only incidental.

Primary intestinal toxemia, which is most frequently encountered, is a biochemical change from normal digestion in the intestinal canal. It takes place in the contents of the small intestine rather than the colon, although most frequently its whole process is installed in the ileum and in the colon to the hepatic flexure. In my opinion, it is entirely bacterial in nature. Whatever the food, whatever any other condition, it is the change from a normal bacteriology of the intestinal canal that figures most prominently as the cause. An examination of specimens of the stool will prove this, but the analyses must be more complete bacteriologically and chemically than those done in laboratories today. Examination of the urine may or may not be valuable; with normal urine the stool specimen often will be positive. To mention all the laboratory technic and findings in this work would be most uninteresting and out of place in a short paper like this. It would require a great deal of space and is obtainable by a study of the literature and by laboratory practice. It is more interesting to speak of the cases from a clinical viewpoint. Clinically and confirmed by laboratory the cases occurred as follows:

Secondary toxemia.—Definite anchoring of the gut, 27; intestinal obstruction (incomplete), 19; carcinoma, 14; marked ptosis, 62; tuberculosis, syphilis, etc., 20; nasal and buccal infections, 91; parasitic infections, 43; definite gut infections (specific), 6; neglected routine of life, 69; other causes, 30; total, 381.

Primary toxemia.—Putrefactive (indolic), 180; fermentative (saccharobutyric), 172; mixed form, 224; definite streptococcal or staphylococcal, 43; total, 619.

Although a little theatrical and somewhat overdrawn, Lane's description of the chronic gut case is the best in the literature. He did not distinguish between secondary toxemia, in which conservative surgery might be required, and the primary forms. All was grist to the mill for his propaganda. But

*Read by invitation before the Medical Association of the Greater City of New York, April 19, 1920.

you no doubt remember his descriptions of typical cases, and you have all had so many of them in your practice that I need not detail them again. I shall, therefore, mention states, disorders, or conditions that you may not have thought of as bound up in this subject, and in the instances recorded below they have occurred as recorded in a thousand case records. To me they have distinct significance. While the figures given below relate only to primary toxemias, the conditions occur quite as often in secondary toxemias.

In 619 cases of primary intestinal toxemia the conditions listed below were encountered in the following percentages:

Excessive fatigue	75
Anemia	73
Pernicious anemia	2
Anorexia	37
Insomnia	69
Skin condition (eczema, irritative rashes, recurring urticaria, acne)	9
Fatigue neuroses (neurasthenia)	67
Psychic disturbances	27
Recurring neuritis	7
Recurring headaches, backaches, etc.	69
Vagotonia	4
Dementia præcox	2
Eye symptoms (color blindness, spots in vision)	6
Asthma	3
Myocarditis (under fifty years)	7
Functional heart conditions	27
Chronic arthritis (nongouty or rheumatic) ..	5
Gastric hyperacidity	54
Gastric or intestinal atony	69
Gastric hyperesthesia	89
Ileal or colonic stasis	91
Chronic disease of the appendix	37
Megacecum (idiopathic)	11
Chronic colitis	69
Intestinal adhesions	32
Ptosis	52
Gallbladder conditions	12
Appendix disease	31
Abdominal distress (intestinal indigestion) ..	94
Endocrine disorders	61
Nephritis	9
Hypertrophic rhinitis	36
Loss of weight	51
Arteriosclerosis (under forty)	43
Functional hypertension	27
Functional hypotension	39

Even this array of disorders might not be so striking were it not for the fact that such marked improvement in many cases was met with while the patients were under treatment solely for the intestinal condition. While it is the consensus of opinion that in some of the cases no permanent benefit can be accomplished, the conditions were ameliorated markedly or cleared up entirely. When one has gone over the vast amount of work of this kind that I have in twelve years' time, the inevitable conclusion is that these conditions are a factor of importance in medicine, and I believe that no chronic condition is accurately judged, etiologically, unless the status of the intestinal canal is taken into consideration.

I have been asked to give a description of the methods of treatment I employ. This depends upon whether the case is primary or secondary, and since, in the primary case the accuracy of judging the bacterial change, the method of bacterial treatments and diets employed, the adherence of the patient

to treatment over four or five months' time, and other measures more difficult to control, only a few general points can be given. Almost daily I receive letters from colleagues, asking such questions as, "What vaccine do you use? What diet do you use?" This type of work is far from simple and is largely individualistic with the single case. Shifts from one vaccine to another, or one bacterial method to another, are common, and sometimes with ideal conditions no benefit or apparent results are brought about.

One might begin by expressing opinions of some of the methods that are employed in an aimless way, both by members of the profession and by the laity. Without careful investigation of the case, so-called colonic irrigations and instillations of bacteria into the rectum are being employed. Most of this effort is commercial in character and most unscientific. The intestinal canal was not intended for irrigation and while some immediate benefit may come from it, in the end it may do harm. No irrigations of the colon have ever been used by me. The general instillation of the *Bacillus bulgaricus* cultures or the *Bacillus acidophilus* by rectum or mouth is of no value. These organisms may accomplish certain results in a laboratory but do not in the human body. They never have acidified a neutral or alkaline intestinal tract, and in a case of acidity (saccharobutyric toxemia), they would do harm, if they could.

A year after the publication of my original article, Turck (2) suggested the use of the *Bacillus coli* subcutaneously. This was followed by Satterlee (3), both taking the stand that the *Bacillus coli* was inimical to the host and vaccination against its effect was helpful. Connellan (4) took Herter's and my own beliefs and assumed that the *Bacillus coli* was beneficial and that more should be added, using my rectal method but modifying it by counting the bacilli. Much criticism may be presented of the statements of these workers regarding my original method, most of which were unfair, unscientific, and proved that these workers had had little or no experience with the method I advocated, and were an effort, principally, to present an original treatment or method of their own. I draw your attention to Herter, Connellan, and myself who take the position that the colon bacilli should be increased in the host, and to Turck and Satterlee, who say that they should be decreased and immunity against them secured. The truth is that in certain types of cases either one of these is correct, but in all cases either one is more often wrong than right. More than that, however, to use one bacterium for the treatment of intestinal toxemia is like employing a single medication for everything in medicine, or one organism to treat all infections and expect their cure by the use of a single vaccine. There are many organisms and groups of them that are the causes of intestinal toxemia in man, and unless laboratory work is done to find out what the status of affairs is, this only adds to the unscientific work of men who see it only as a simple and single condition. In the writings of Turck, Satterlee and Connellan no reference is made to any laboratory procedure to prove the diagnosis in cer-

tain cases, and inasmuch as much investigation is possible of being carried out, even though it may be difficult and require experience and time, such work cannot be of permanent value even though some benefit may have resulted. More than that, to jump to conclusions from a clinical case to the use of a single organism as the cure of them all puts just opprobrium on it, for such hit or miss medicine makes for commercialism, and inhibits the attention and work of the best workers in medicine in a field that requires the closest and most careful study. This slipshod therapy is the cause of advertising and lay institutions engaging in it. There are places in this city run by lay people where patients wait in line for colonic irrigations and bacteria implantation at so much a visit.

There are no so-called intestinal antiseptics that are of any value, or any medical means that can change the biochemistry or bacteriology within the gut. The drinking of large quantities of water or fluid during the day (5) is of some value but not always advisable, difficult to keep up in quantities of 3450 c. c. per diem, and only of very moderate service in cases of putrefaction. Up to the present, fresh air, systematic exercise, temperate living, and an anticonstipation diet would accomplish more than any or all so far mentioned.

The two measures I would present as of the most value are diet and bacterial treatments. The diet should be a carbohydrate and hydrocarbon one in the putrefaction (indolic) case, a high protein in the fermentation (saccharobutyric) case, and one of carefully weighed foods so as to keep down to a minimum caloric value in the mixed form. Lactose by mouth is of no value, but the plan of Chetham-Strode and Benjafeld (6) of feeding coarse, uncrushed grains, somewhat sustains an acidity if a suitable bacteriology is present in the gut—which unfortunately is seldom met with in the putrefaction case; but when this is present a lactic acid carbon dioxide result can easily be accomplished. What one must always keep in mind, by dietetic treatment alone, is that most of the infecting forms of bacteria in the gut are facultative, and while they may be favorably influenced by diet, this is transitory and not dependable in therapy after a few weeks' time. Since no purgation should ever be permitted in these cases, the bowels must be regulated by the well known dietetic and physical measures, and not even by irrigations or enemata of any sort.

The bacterial treatments are based upon the findings in complete examinations of the stools and urine under known conditions of diet. This diet should be the normal one for the age, work, and weight of the individual. One suitable for a man weighing 150 pounds is the following:

Morning.—Two thin slices of well baked bread with butter liberally applied; one pint of oatmeal gruel, made of about forty grams or one and a half ounces of oatmeal; ten grams or one third ounce of butter; 200 grams or six and two thirds ounces of milk; 300 grams or ten ounces of water (all strained). One egg cooked in any form.

11 a. m.—Milk, half a pint or one glass.

Noon.—A good sized piece of roast beef or steak,

chopped or cut into very fine pieces (about 120 grams or four ounces) and served on a slice of toast; one bowl (about 250 grams or eight and a third ounces) of mashed potato, with twenty grams or two thirds of an ounce of butter.

4 p. m.—Milk, half a pint, one glass.

Night.—Same as for breakfast.

Water may be taken as desired.

After the third or fourth day a twenty-four hour collection of urine and a stool specimen passed in the same day are examined. In addition to the routine examination of the urine, the uric and oxalic acids are estimated, and a sulphate partition is made. The stool is examined in the usual way, and in addition a gram differential count of the gram negative and gram positive organisms and a study of the bacteria are made. Food detritus is separated from bacteria and an estimate of percentages in dried weights is made. When there is any doubt, inoculation observations under aerobic and anaerobic conditions and different media are performed. Complete x ray examination of the gastroenteric tract is done almost as a routine, the idea being to place the case in the secondary group if possible. Attention is also paid to stasis, ptosis and dilatation of different sections of the digestive tract in the abdomen. The detail in these examinations, differing as it does in different cases, is too large a matter to enter into here and may be found in the literature, but widely scattered. Suffice it to say that all of this work could be done by anyone who has had some practice in it, but it means work, and in my opinion the diagnosis of intestinal toxemia should be made in this way only and never just assumed from clinical aspects.

If bacterial treatments are carried out they should be autogenous if possible. It is not always easy to decide which one organism or what combination of organisms is infecting the canal. Symbioses rule high in intestinal bacteriology. Likewise it is not always possible to decide in advance whether the best results would come from the vaccination method, that of antagonisms or by biochemic alteration (using the infecting organisms but changing them biochemically by different media). Thus, with me the first three or four weeks are always experimental, with one week of laboratory observation. By close attention one gets straightened out. Both the rectal and subcutaneous routes are used, the bacteria being killed in the subcutaneous, but left viable in the rectal. A list of the bacterial treatments I have used in the three methods are the following:

RECTAL METHODS—BIOCHEMICAL ALTERATIONS.

Occasionally infecting bacteria can be changed biochemically by growing under different media and these used to substitute those present in the body. Successful examples of this have been found in cases of infections with *Bacillus coli aerogenes capsulatus*, *mesentericus* and *putrificus*.

RECTAL AND SUBCUTANEOUS METHODS—BACTERIAL ANTAGONISMS.

Saccharobutyric (high protein diet).

Bacillus aerogenes capsulatus.

Gram positive diplococci.

Gram positive single cocci.

Bacillus bifidus.

Bacillus coli (many different strains and perhaps collected from different sources). For the first two a strains, for the second two the b strains are best.

INDOLIC. (Low protein and high carbohydrate and hydrocarbon diet).

Bacillus coli.
Bacillus mesentericus.
 Gram negative streptococci.
 Gram negative staphylococci.
Bacillus proteus vulgaris (*Bacillus Welch*).
Bacillus cloaca (*Bacillus coli*, polyvalent strains).
Bacillus pyocyaneus (*Bacillus coli*, a strains).
Bacillus putrificus (*Bacillus coli*, b strains).
Bacillus acidophilus.
Bacillus bulgaricus.
Bacillus lactic aerogenes.

MIXED. (Least possible amounts of foods, no cheese, peeling of fruits—mostly boiled foods).

No action on antagonisms possible by rectal or subcutaneous methods excepting when a predominant type of bacteria is present.

The difference between the a and b strains of *Bacillus coli* is that a does not produce gas in saccharose, and the b does. The effects are the same on all the other sugars and on the coagulation of milk.

RECTAL AND SUBCUTANEOUS METHODS—VACCINE IMMUNITY.

Saccharobutyric.

Bacillus aerogenes capsulatus (rectal).
 Gram positive diplococci (skin, rarely; rectal, rarely).
 Gram positive single cocci (rectal).
Bacillus bifidus (rectal, rarely).
Bacillus putrificus (rectal, rarely).

INDOLIC.

Bacillus coli communis (rectal; skin).
Bacillus mesentericus (rectal).
Bacillus liquefaciens (rectal).
Bacillus proteus.
 Gram negative streptococci (skin).
 Staphylococci (skin).

MIXED.

Combination of methods outlined above according to predomination of fermentation or putrefaction and types of organism. The rectal method is used here altogether, and effort is made to get reactions and a leucocytosis of from ten to twenty thousand within eight hours after the injections.

The bacterial treatments are kept up for four or five months, according to the type of cases, method employed, and bacteria used. After the first month the diet is no longer important. Constructive and tonic additions to treatment are added, and at the end of the bacterial treatments the stools and urine are examined each month for six months to see that the results remain permanent.

These, briefly stated, are the methods I have employed for over ten years, the total number of cases now comprising close to five thousand. There may be easier and simpler forms of treatment but none that I know of gives the results that have been accomplished. To me the diagnosis and successful treatment of chronic excessive intestinal toxemia is far from a simple matter. The work should be done as dispassionately and as far from assumption as possible. In addition to the clinical aspects, the work should be done in both diagnosis and therapy almost entirely from the laboratory, and the closest sort of attention is required all the way through. I wish I knew of an easy way. The therapeutic part of the work may be done in a few moments of a patient's time in the office, but to conduct the bacterial treatments as I believe is required and treat thirty cases at a time requires that the laboratory must be actively working at least twelve hours

a day and often during the nights and on Sundays. To handle these cases properly requires more work with proportionately less financial remuneration for the expenditure of time, attention and energy, than any I know of in medicine. But the satisfaction experienced in the results obtained repays one, because commonly the results are so startling that one has hesitancy in recording them in the literature.

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CONSTIPATION AND THE EFFECT OF PURGATIVES ON HEART AND VESSELS.

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We speak of constipation when the bowels cannot be evacuated at least once a day without aid, that is, when a spontaneous emptying of the bowels has partly or entirely ceased and the patient has to take purgatives or enemas. Some patients use purgatives for years apparently without bad results, changing the remedies as they are recommended to them by relatives and friends, by the newspaper and by the druggist. However, a time will come when medicines lose their effect and the patient has to consult a physician. Long before this we find, in practice, a large number of people who suffer from incomplete constipation which usually precedes the complete form. These patients, still being able to procure an evacuation with purgatives or enemas, do not trouble about their ailment.

Constipation is a serious disease and should never be neglected when discovered during an examination or treated by adding another purgative to the list the patient has already used.

Health and comfort depend largely on well functioning bowels, and the diseases due to toxins absorbed from putrefying waste retained in the colon and from macroparasites and microparasites which find, under these conditions, a favorable soil in which to grow, are familiar to every practitioner. Sufficiency is the essential feature of a normal stool and though it is impossible to determine whether the stool corresponds in quantity to the food ingested, we can estimate, and occasionally by giving an enema after defecation can determine with some accuracy, whether the bowels have been emptied. A constipated stool is insufficient in quantity, hard, and delayed, though a semisolid and even liquid stool is constipated, if insufficient. A daily sufficient evacuation is the normal. Several factors are necessary to produce this.

1, A free, unobstructed intestinal canal; 2, a normal abdomen and normal muscles; 3, a sound and well functioning nervous system, causing in-

testinal peristalsis, relaxation of the sphincter and the action of the belly press, fixation of the diaphragm and pressure of the abdominal walls upon the abdominal contents; 4, a sufficient amount of waste matter in the colon; 5, a normal consistency of the fecal matter, neither too hard nor too soft.

Next of importance to the knowledge of the cause of the constipation is the diagnosis of the exact state when first seen; incomplete or complete, atonic or spastic. Constipation commences with atony of the bowels. In this state the muscles of the colon are weak and relaxed. This condition may last for years, till finally, due to irritation by hard scybala and abuse of purgatives, a catarrh is established. Hard scybala and flakes of mucus make the diagnosis of catarrh an easy matter. Flatulence and fine particles of mucus mixed with the fecal matter indicate an involvement of the small intestines, and icterus, that of the duodenum.

The constant irritation of the colon causes contractions; it feels like a smooth cylinder rolling under the palpating fingers, and it frequently gurgles. This manipulation is usually painful and the accompanying constipation may alternate with attacks of diarrhea and gradually pass into a continuous diarrhea. Membranous enteritis is an advanced state of catarrh. In this condition fecal matter is frequently retained for several days in the contracted parts of the colon, and the decomposed mucus acted upon by the acid stool is expelled in large flakes of cylindrical shape or like jelly, which under water take the form of membranes. The expelling of the mucus is accompanied by colic, after which the patient feels better.

CONDITIONS CAUSING INTESTINAL STASIS BY NARROWING AND OBSTRUCTING THE CANAL.

Among the conditions that will cause stasis are duodenal or rectal strictures, old scarified ulcers of tuberculosis and syphilis, malignant growths, partial torsion and moderate invagination, incomplete hernias, adhesions following peritonitis, appendicitis, cholecystitis and laparotomy, kinks, pressure of an ovarian cyst and gravid uterus, or an anal fissure, which due to pain will cause an excessive contraction of the sphincter. If the obstruction is located in the small intestines, stasis may be overlooked for a long while. The liquid contents of the small intestines pass the narrowed section for some time. These conditions have to be eliminated and a careful examination of the rectum, uterus, and hernial sites has to be made.

Inspection should never be neglected. Large saugelike stools indicate atony and ribbonlike stools spastic conditions or obstructions. Black stools are due to blood or medicaments like iron and bismuth. Calomel colors the stools green and grey fatty stools are due to absence of bile in diseases of gallbladder and duodenum, in severe anemias and chronic peritonitis. Fresh blood comes from the end of the tract. Black stools, if the coloring is due to blood, may be due to ulcers of stomach and duodenum, enteritis and malignant tumors, typhoid fever and purpura. Pus in large quantities indicates a rupture of an abdominal abscess into the intestines. If the pus is mixed with the stools, usually with blood, and accompanied by diarrhea, it indicates an ulceration of

the colon. Tenesmus, blood, and mucus are characteristic symptoms of dysentery. Mucus enveloping the stools indicates a catarrh of the rectum, and if mixed in small particles with the fecal matter, catarrh of the small bowels.

PATIENTS WITH ABNORMAL ABDOMENS.

Multipara with frequently ruptured perineums, and most enteroptotics, furnish the vast majority of constipated people. The enteroptotic usually has a pendulous abdomen with weak and relaxed abdominal walls. With some, however, the abdominal muscles may be hard, like cords, but more or less widely separated. The intestines are usually displaced and the transverse colon sometimes approaches the V shape which, of course, interferes with a normal evacuation. All of these patients are hysterical and neurasthenic and the influence of the nervous system is abnormal and adds to the trouble caused by the displacement and lack of muscular development.

TREATMENT OF CONSTIPATION.

This should be directed to the cause of the constipation and must be surgical in some cases. No cure can be hoped for unless the cause is treated. If the constipation is due to lack of enervation much can be done. Young girls and women do not respond to the call of nature on account of false modesty, and business men neglect it, because they are too busy. They commence to take purgatives and must take larger and larger doses to produce results and invariably end, often after many years, with serious difficulties.

It is not only necessary to strengthen and regulate the enervation in cases like these, in which the failure of the nervous system to act is the prime factor, but it is always useful, no matter what the cause may be. The bowels cannot be satisfactorily emptied unless the nervous system is intact and functioning properly. This is illustrated in organic diseases of the spine and brain as well as in toxemias. In these cases complete stasis or involuntary movements follow; a powerful peristaltic wave must pass down the intestinal tract, the sphincter must relax, the diaphragm must be fixed and the abdominal walls press upon their contents, when the brain is notified that the rectum is filled and evacuation needed. To have this act performed at a certain time and place, it must be learned until it is habitually performed. Infants are taught by their mothers till a fixed habit is established which usually lasts during life and is interrupted only by disease, change of place and later on by occupation and negligence. The taking of a journey on railroad or steamship interferes with it and people knowing this by experience provide themselves with purgatives before they enter on such a trip. Even moving into new quarters will often break the habit. The accustomed time and the familiar surroundings are necessary to produce prompt action. To re-establish the lost habit the patient must be advised to go to stool every morning at the same hour whether the desire is present or not and the importance of this measure must be explained to them and they must be impressed with it. Suggestion given by the physician or practised by the patient

himself will assist materially and often this alone is sufficient to cure. The inhibition which is present is removed by it and a powerful peristaltic wave will pass down the intestinal tract at a given time. To strengthen the habit and to make it firm it is best associated with another act habitually performed at the same time, or preceding it to give as it were a time signal to the brain. Most people have found out the efficiency of this measure by experience. They go to stool on arising, before or after the bath, before or after breakfast. Some have to smoke a cigar or pipe and some tell us that they cannot have an evacuation unless they take an apple at night, a soft boiled egg in the morning, a spoonful of honey and the like. Defecation is an automatic act and the habit must not be interfered with when it is once established.

CONSTIPATION DUE TO WEAKNESS OF MUSCLES.

It is evident that nerve stimulation cannot act efficiently if the muscular apparatus is not intact. The muscles of most patients suffering from constipation are weak and flabby, due to the lack of exercise. Bookkeepers, professional men, officials, sewing girls, tailors and all who lead a sedentary life are the victims. Massage and exercise may be used to strengthen the muscles. Before advising this, all inflammatory processes and conditions obstructing the intestinal canal must be excluded. If a tumor is palpable the intestines have to be cleansed thoroughly with enemas and castor oil and if after these measures the tumor can still be felt, massage must not be given. Even if a fecal tumor is diagnosed, massage is contraindicated, unless an inflammatory process can be excluded. Intestinal ulceration, tuberculosis, cancer, syphilis, chronic appendicitis, and cholecystitis, contraindicate massage.

Massage, when indicated, is commenced with a light circular stroke from right to left around the navel to treat the small intestines, to be followed by a firmer stroke along the colon. The masseur commences in the right iliac fossa, strokes along the ascending colon to the border of the ribs, across the abdomen, along the transverse colon and down the descending colon making deeper pressure on reaching the flexure and following it to the beginning of the rectum. This stroking has to be repeated a number of times to prepare for the rubbing. The left hand is then gently but deeply pressed into the iliac fossa with finger tips down, while the right hand rests over the left, the fingers of the left rub the ascending colon and gently but firmly push and press its contents onward along the course of the colon. This manipulation should be repeated a few times only; or the left hand is gradually deeply pressed into the right iliac fossa, next the right is placed before the left in the same manner, then the left before the right always gently pressing and pushing the colon contents onward. The rubbing and pushing have to be executed with a greater force along the flexure, the usual place where fecal matter collects. In some cases, especially in the obese and those with relaxed abdominal walls, the abdominal wall may be grasped with both hands and pushed from side to side, forward and backward, moving the whole of the abdominal contents.

Tapotement follows with the hand formed lightly to a fist or with the whole hand slightly made hollow so that only the borders strike. Vibration, best with an instrument (the vibrator), and finally a gentle circular effleurage from right to left close the procedure. If massage is given at all in the spastic form of constipation only a very gentle effleurage can be used and this with the greatest caution. A contracted colon will often relax under gentle treatment and pain may be stopped.

Abdominal massage should only be given by a physician who is familiar with the method or by a well trained masseur under the direction and observation of the physician. It is an efficient method and often will cure when all other methods have failed.

EXERCISE IN CONSTIPATION.

Outdoor life and exercise in the open are the best methods for preventing constipation and help to cure it when established. Walking, riding, rowing, tennis, golf, work in the garden, and other pleasurable exercises which divert the mind are the most useful. These patients are depressed and constantly occupied with their trouble which of course interferes with the evacuation. If these pleasurable exercises cannot be had or not in sufficient amount, then the patient has to be directed to walk to his place of business, the housewife has to go to market, etc. Room exercises are useful in every case. They are best taken in the morning naked before the bath, to secure an airbath. One of the most useful exercises is deep breathing. This strengthens the abdominal muscles and exerts a powerful pressure upon the abdominal contents. The patient lies on the floor on a blanket or upon a hard couch with knees flexed and mouth slightly opened. He then takes a deep breath, flattening the abdomen and exerting pressure upon its contents. He has to repeat this five times with a pause between each breath, a longer pause follows and the cycle of breathing has to be repeated five to six times. Bending forward, going into the bent knee position, picking up objects from the floor and similar exercises should be added.

HYDROTHERAPY.

Hydrotherapeutic measures are always helpful in the treatment of constipation. A warm bath in the morning, followed by a cold douche or ablution and friction with a rough towel, will be found helpful. In spastic constipation, warm and hot applications, a hot sitzbath or a full prolonged warm bath and hot drinks are indicated. Electricity is helpful, the sinusoidal current causing rhythmical contractions of the abdomen. The faradic current may be used instead, with a large electrode over the lumbar portion of the spine and a special electrode in the rectum. Before introducing the electrode, from 100 to 150 c. c. of lukewarm water should be injected to make contact between the mucous membranes of the rectum and the electrode. These various physiological measures act directly upon the intestines and improve general health by causing a better blood distribution, increase organ activity and free the blood from impurities. Muscles gain in strength and volume and the bowels commence to function.

DIET IN CONSTIPATION.

Bulk and consistency of the stools depend on the diet. A suitable diet has to be prescribed in every case. The exact state of the constipation, atonic or spastic, complete or incomplete, the state of the nutrition of the patient, whether fat or lean, age, sex, and occupation, indoor or outdoor life, the functioning of the endocrine glands, diseases which accompany the constipation, climate and season, all are factors which have to be carefully considered in prescribing the diet. The object of every diet is to furnish the needed amount of food for the production of energy and heat, for growth and repair. The diet must be sufficiently bulky and mechanically stimulating if the constipation is atonic, and non-irritating and stimulating chemically if it is spastic. Going to the toilet is best accomplished after breakfast, when the food of the preceding day has passed the intestinal tract and the morning meal excites it to act (Osborne). The seat of the toilet should be low or a footstool placed under the feet. The squatting position is assumed by primitive man to empty his bowels and is most efficient. People may know this from experience on hunting and fishing expeditions. In this position the thighs press well against the abdomen and the sphincter is stretched.

Fats and starches have to be increased or decreased according to the state of nutrition, occupation, climate and season, liquids regulated according to the consistency of the stool and meat allowed in proportion to the exercise taken. Meat is only assimilated during exercise and in disease.

In atonic constipation articles of food are to be preferred which excite and increase peristalsis and increase bulk; cold water in the morning, lemonade, buttermilk, cider and honey, fresh and stewed fruits like prunes, raisins, figs and dates, the dried fruits being soaked in water overnight and then well stewed; graham bread, and rye bread, the green vegetables like spinach, young sprouts, okra, snap beans, cauliflower and mustard greens, beet tops, carrots and potatoes; the coarser vegetables, cabbage, beans and peas, in selected cases. They produce flatulence and increase the trouble, if they do not cause an evacuation.

In spastic constipation fats, olive oil, butter and cream should be given in larger quantities; fruit sugar, honey, buttermilk and clabber, freshly pressed fruit juices, apple butter, plum butter, fruit jellies and purees of the tender green vegetables in butter act chemically and increase bulk without irritating the inflamed tract. All foods should be given in the semisolid state.

The following table may serve as a guide, varied as indications demand:

A glass of cold water should be taken on arising. Breakfast: A cup of coffee with cream; graham bread or rye bread with butter and honey; or clabber, buttermilk or cream cheese. Dinner: Lettuce and olive oil, creamed or baked potatoes with butter, the green vegetables in butter and fish or meat as indicated; ripe and juicy fruits, stewed fruits and fruit jellies. Supper: a glass of buttermilk, a plate of clabber, a soft boiled egg, graham bread, rye bread and butter. Fruit on going to bed.

ENEMAS.

Enemas are well adapted to empty the colon at once of stagnating masses of fecal matter. A large amount of water injected, to which soap, salt or castor oil has been added, stimulates the intestinal peristalsis powerfully, and an evacuation follows promptly. Solution of the stool is of little consideration. For mild stimulation a small enema of lukewarm water is sufficient. For stronger stimulation, the temperature of the water has to be cold, even ice cold, if a small enema is administered. If the higher portions of the colon are to be reached, the rectal tube has to be used (Nelaton). Oil enemas are of great importance and especially useful in the treatment of spastic constipation, though they do not act in every case. The oil may creep up to the ileum, it lessens absorption of water, acts as a lubricant and by splitting off oil acids stimulates peristalsis. Inflammatory processes and intestinal ulceration are not contraindications to the method. The enemas are best given at night and consist of a half to one pint of olive oil or cottonseed oil. The patient's hips are elevated and he lies on his right side. The colon tube, well covered with petrolatum is introduced about four to six inches and the oil allowed to flow into the colon under low pressure from fifteen to twenty minutes. The evacuation follows the next morning, though occasionally a watery enema may have to be added in the morning to produce results. A daily oil enema is rarely necessary. Enemas are useful and are the most harmless remedy, provided the technic is correct. Large enemas, too frequently repeated, distend the colon, which loses its tone, and this increases the trouble.

THE ENDOCRINE GLANDS.

It has been mentioned that the glands of internal secretion must be considered. Their function is disturbed in every disease and their failure to act may be the cause or the consequence of the constipation. If they are the cause, substitution and homostimulation alone will be frequently sufficient to relieve the condition (1). In either event medication in this direction is indicated. The obese if suffering from constipation due to poorly functioning thyroid and ovaries need the extract of these glands. However, the physiological methods must be combined with this medication to return the composition and distribution of the blood to the normal which in its turn will secure proper functioning of the failing glands. People finally have to get along with air, food, rest and exercise. The same may be said for the enteroptotics, with hypofunctioning of the pituitary, thyroid and adrenals. They need the substitute to get relief, and together with rest, diet, and the other therapeutic measures, to bring about a permanent cure. Rest in the recumbent posture secures a better blood supply to thyroid, thymus and pituitary and relieves the adrenals. Hormonal, a peristaltic hormone, is stored away in the spleen and has been successfully used to relieve chronic constipation, and biliary salts are now frequently employed for the same purpose. In the absence or diminution of bile, in hepatic disorders, bile and preparations containing it in some form, are indi-

cated, of which a number are on the market. Bile acts as a cholagogue and laxative, and neutralizes the intestinal ferment, mucinase, which coagulates mucus. Roger, who made this discovery, recommends oxgall in the treatment of membranous enteritis, and Pauchet recommends adrenal organotherapy.

THE TREATMENT OF CONSTIPATION WITH PURGATIVES.

With drugs we can meet every indication and empty a clogged bowel in short time. We can increase the tone of nerves and muscles, and increase or decrease peristalsis. We can influence the consistency of the stool by increasing or decreasing intestinal secretion, soften fecal matter, liquefy it or lubricate and increase the bulk.

The treatment with drugs is necessary in almost every case, though the physiological methods should be tried and drugs added and gradually withdrawn or the one and the other method alternately employed till a cure is perfected. If the constipation is not the main trouble but only a companion of some serious disease, purgatives are indicated. If we wish to act solely upon the nervous system, we give preparations of *nux vomica* or its alkaloid strychnine. It stimulates and gives tone to nerves and muscles. *Belladonna* and *atropine* retard peristalsis, relax spasms and stop pain, and are indicated in spastic condition of the intestines. If the stools are hard, drugs must be prescribed which increase intestinal secretion or strong solutions of the saline laxatives which liquefy the stools. *Liquid petrolatum* acts as a lubricant and the *agar-agar* preparations increase bulk, stimulating mechanically. Bran and similar irritating substances should not be used for any length of time and never in spastic constipation.

The vegetable purgatives are classified as aperients, laxatives and drastics. They act irritatingly upon the intestinal mucous membrane, increase peristalsis, produce hyperemia and increase secretions. The effect of their administration is a more or less thorough and rapid semisolid evacuation of the intestinal contents. Increased peristalsis and increased secretions prevent the thickening of the contents as they pass rapidly through the colon. Some of these, like *podophyllin*, *aloes*, and *senna*, act when given by hypodermic injection, but as they are excreted in the intestines it is probable that their action is a local reflex one, not differing from that when given by mouth. Most of these, especially the drastics, cause pain and inflammation when given in larger and repeated doses, due to the violent peristalsis they produce. Some have the reputation of increasing bile production and others do not act when bile is absent. Some increase the peristalsis of the whole intestinal tract and others affect the colon only. Those that act solely upon the colon are preferable in the treatment of chronic constipation where change of remedy and a prolonged use are necessary. Purgatives should be changed if a continuous use is indicated, to prevent intoxication, irritation of the mucous membrane and the taking of larger and larger doses, which becomes necessary if the same drug is continuously used. Drastics should be only occasionally used in cases without complications.

Castor oil and calomel are most frequently employed to empty the bowels thoroughly; they may be administered every eighth or tenth day. They affect the whole tract from pyloric orifice to rectum and empty the gallbladder by mechanical traction. The violent peristalsis opens the papilla. Croton oil is rarely used, and only in severe constipation without complications and in uremia when other means have failed. *Jalap* is frequently employed to produce watery stools in edema and ascites. *Podophyllin* acts as a cathartic in larger doses and may be used in small doses in the treatment of chronic constipation. It acts well in hepatic disorders. A common and very useful household remedy is a jam made of raisins, prunes, dates and figs, with a cup of honey or molasses to which *senna* is added. The active principles of *rhubarb*, *aloes*, *casgara sagrada* and others when given, are gradually set free in their passage through the intestines and exert their action especially in the colon. *Aloes* increases tone and irritability of the colon when given in doses of one twelfth to one grain, three times daily, sufficient to produce a satisfactory stool; the dose may be gradually decreased and finally discontinued. *Rhubarb* increases intestinal secretion and stimulates peristalsis. A small dose at night may be given for a long time without harm. *Casgara sagrada* acts upon muscles and tissues of the intestines through the sympathetic fibres which supply them. It acts well as a mild laxative, without causing pain or inconvenience. *Phenolphthalein* is effective and frequently used. *Black alder* is a tonic laxative especially useful for continuous employment when hemorrhoids are present.

The saline laxatives, magnesium sulphate and the sulphates, phosphates, tartrates and citrates of sodium and potassium attract water more than the cells of the body which property prevents absorption during their passage through the intestines, keep the intestinal contents in a liquid condition, and by slight local irritation increase peristalsis, which is aided by the hydrogen sulphide which is set free. The laxative mineral waters contain these salts and should be given warm an hour before breakfast.

The use of purgatives by rectum is rare; they do not produce a thorough evacuation but are useful when purgatives by mouth and enemas are contra-indicated; glycerine by injection or as a suppository are the most frequently used. Soap suppositories are useful in the treatment of infants.

PURGATIVES IN DISEASE.

Disturbed bowel action, frequently constipation, usually accompanies organic and infectious diseases. Prolonged rest, a change of diet and the intoxication produced by the disease itself, are the cause. It is next to impossible to treat constipation, accompanying disease, without purgatives, yet it is far more important to empty the bowels of the sick and keep them clean, than it is of healthy persons. The colon is an organ of absorption as well as a waste pipe. The epithelial cells covering the absorbing glands become paralyzed when exposed to putrefying waste too long, and allow toxins to pass which add to the toxins produced by disease. Normal function of all organs becomes seriously affected on account of in-

sufficient elimination by congested kidneys, impure blood and disturbed circulation; under such conditions recovery is difficult. "Blood alone cures, and to assist nature we have to purify it and bring it where it is needed. Nature repairs and cures with hyperemia. The purer the blood, the better the function of every organ, which in turn produces a perfect blood, hyperemia and recovery. It is therefore of the greatest importance to commence treatment by thoroughly emptying the bowels and keeping them clean with purgatives till recovery has progressed, then the physiological methods have to be substituted till the bowels function without aid." (2) Purgatives have to be prescribed according to the indications previously discussed. The acute infectious diseases commence usually with a chill, the skin is cold and clammy and the body temperature is high. There is no better way to correct the faulty circulation than by an enema, followed by a purgative, a hot footbath which brings the blood to the surface where it cools and returns cooled, and an icebag to the head to prevent congestion. The chill ceases, the body surface becomes warm and moist, the temperature drops, the high blood pressure is lowered and a dilated heart returns to the normal size and gains in strength, and with the clean bowels the patient has a better chance to recover. It is probable that it is this action of the purgatives on the circulation, which acts like bloodletting, together with their cleaning effect, which has led to the almost universal practice of commencing the treatment of the acute infectious diseases with a purgative and repeating the dose from time to time during its course. Whatever is done to relieve the patient, a permanent cure can only be secured when it is borne in mind that nature cures with hyperemia and that a pure blood—that is, a perfect composition of the blood—will assist her in her efforts. All therapeutic methods must be used to secure it. If we do this we assist nature and practice rational therapy.

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DIETARY TREATMENT OF CONSTIPATION.

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The part played by dietetics in the treatment of constipation, while most interesting, is, to my mind, subsidiary, and before preaching dogmatic statements on dietetics I shall present a brief consideration of the etiology of constipation, for if practical application of the dietetic treatment as outlined herein were attempted without an investigation of the etiological foundation of the condition, my statements would be considered inaccurate and be cast aside on the ground that they were not applicable to the practical work as seen daily in the office of the physician.

In discussing the dietetic principles it is necessary to keep clearly in mind that there are types of cases

in which dietetic principles are not to be applied until the etiological factor has been corrected.

Murray (1), in a clear and concise paper on the subject of constipation, takes as the keynote of his discussion the fact that an insufficient intake of water is the therapeutic factor in a large number of cases. We know that the daily excretion from the kidneys is forty-eight ounces; that sixteen ounces are excreted through the skin, and another sixteen ounces through respiration. Therefore, there must be a total of eighty ounces of fluid intake in order to supply nature's wants, and this is the first dietetic measure which must be insisted upon. Very few people make a practice of drinking water other than at their meal times, women being the worst offenders in this respect, and the records of my office show that there are three cases of constipation in women to one in men. I believe this is due to two faults: First, a lack of fluid intake, as previously stated; and, secondly, because of the fact that women are irregular in their habits, are prone to be late risers, and put off the act of defecation until the defecation reflex has become so benumbed that it no longer responds. It is an old adage that everybody's business is nobody's business, and it is applied in constipation that any old time to go results in no time for the desire to do so.

Therefore, in the treatment of constipation, we prescribe two glasses of very hot water on arising, to which is added, in some cases, a teaspoonful of salt, in others two teaspoonfuls of bicarbonate of soda, and in others two tablespoonfuls of milk sugar, the selection of the soda bicarbonate being made in the high acid cases and those accompanied with acidosis, and the milk sugar used in cases in which these factors are not present and for its distinctively laxative value. Following this we insist upon fifteen minutes' exercise, and then the patient, after a stimulating cold sponge, is dressed, feeling fit and ready for his breakfast, which should consist of some fruit, followed by a cereal, such as oatmeal or grape nuts, with which one or two tablespoonfuls of agar-agar are mixed. White bread should be interdicted in these cases for the reason that it does not cause sufficient intestinal stimulation; rye or Boston brown bread should be used in its place. Do not forget that butter is distinctly laxative, and the patient should be encouraged to take large amounts.

We have a special bread, the recipe for which we give to our patients, which is procurable at several bakeries in Brooklyn. The formula for this is as follows:

BRAN BREAD.

Two cups of wheat bran.
One cup of flour.
One teaspoonful of salt.
One and a half teaspoonfuls of baking powder.
Three tablespoonfuls of molasses.
Mix bran, flour, baking powder, salt, and molasses. Then add enough milk to make a dough. Various fruits, such as raisins, figs, and dates, may be added if desired. Bake the dough in the form of a loaf, or gems to vary the monotony. This same dough can also be steamed as a pudding and served with honey or other syrup.

We encourage our patients to take this bread in the morning with honey or marmalade, as both are

distinctly laxative. Bear in mind that smoked foods are distinctly stimulating to the bowels because of their chemical action, and for this reason, bacon, ham, and smoked fish are particularly advised. If the patient is allowed to take coffee, there is no better stimulant to intestinal motility than a cup of coffee, and patients are encouraged to use in this large quantities of condensed milk, as this is distinctly laxative.

Immediately after breakfast the patient is encouraged, if a male, to resort to a pipe of tobacco, and possibly a cigarette for women may do as well. This will stimulate a desire for movement, and the patient is told that time must be spent in the bathroom in an effort to produce a movement. Regularity is the keynote of success, and if a definite time of day is set, it should be directly after breakfast, because the intake of food on an empty stomach should stimulate gastrointestinal motility and bring on a desire for movement.

Neglecting the call of nature should never be allowed, as the rectum is a very delicate structure, and failure to respond is the cause of the majority of cases of constipation. A great aid is Kelly's suggestion of placing a box in front of the toilet seat so as to lift the feet from the floor, thereby bringing the thighs up to the trunk and aiding greatly in the expulsive force.

Patients are instructed at ten o'clock in the morning to drink a glass of buttermilk, sour milk, or koumiss, which, due to their chemical action, are a great stimulant to intestinal movement, and as many of these patients have a proteid type of intestinal intoxication, the lactic acid ferments in the fermented milk, while they may not fulfill all the claims that were made for them by Metchnikoff, do aid in the return of the intestinal putrefaction to a more normal type. They should be instructed to take eight ounces of water. Before luncheon four tablespoonfuls of olive oil are taken for its laxative action. If it is repulsive it can often be taken exceedingly cold or even on cracked ice, when it can be tolerated.

For luncheon the patient may have a small portion of meat, but there should be insistence upon a vegetable intake. Green beans, celery, cabbage, onion, cauliflower, carrots, and beets are particularly insisted upon, and with luncheon salad should be used with olive oil and vinegar.

The bread should be the same as for breakfast, and a dish of stewed fruits, figs, pickled peaches, or apricots taken with a glass of cider, which is distinctly laxative, with a tablespoonful of milk sugar in it. At four o'clock another glass of buttermilk is advised, and at five another glass of water. Dinner should be preceded by the olive oil and should consist of meat with vegetables, Brussels sprouts being thought of, a fruit salad with much oil and vinegar, and a dessert of stewed prunes, to which a tablespoonful of agar-agar has been added. Before retiring at night, if it does not disagree with the patient (by that I mean if it does not prevent his sleeping), some fruit should be taken along with some of the laxative bread, with honey on it. Carbonated waters are stimulants to peristalsis, and White Rock water can be advised. Ginger ale

should always be interdicted as it is distinctly constipating. Where the bowels are unusually sluggish, some time during the day a half cup of pure wheat bran taken with a glass of milk adds to the intestinal content.

The great point to be borne in mind in the treatment of cases of constipation is that these patients because of intestinal toxemia are constantly reducing the amount of their food until such time as there is not sufficient intake to stimulate the intestinal motility, and later on in this article a method will be presented showing how this can be overcome. The difficulty with this diet is that the patients become tired of certain articles, of food, and your success will be enhanced if you are able from time to time to offer suggestions which will vary the monotony.

Articles which will be particularly spoken of as laxatives are as follows: Many patients are aided by the use of the petroleum oil. This can be taken in doses of four tablespoonfuls three times a day. The difficulty in connection with the use of the oil is that often a patient loses control of the sphincter and the oil is passed when gas is expelled. To overcome this we have combined the oil with grape juice in the preparation of equal parts of grape juice and oil, which is emulsified by the use of mucilage of acacia in the proportion of one ounce of mucilage of acacia to the pint. If this is shaken up directly before taking it emulsifies the oil in a measure and prevents this disaster. By this method we have also been able to disguise the oil, and patients will take it to whom the plain oil would be repulsive. To a person who has no repugnance for oil, we often use plain white petrolatum, a teaspoonful three times a day. This is disguised by spreading it on a cracker and covering it with some jelly or marmalade. Honey has been referred to as being laxative, and molasses is also a most effective remedy. Patients are instructed to take two tablespoonfuls of molasses three or four times a day, which can be diluted with water and used as a beverage or, if the patient will take it, pure cider can be drunk freely.

There are numerous cereals and laxative biscuits of various kinds on the market, all of which are useful in the treatment of constipation. One of the most effective breakfast cereals is made of flaxseed and is easily procurable. Their action is along the same lines as agar-agar therapy. Wheat bran has already been spoken of and serves to supply the bulk but does not hold the moisture as agar-agar does. Our aim is to eliminate entirely the use of drugs with possibly the exception of various liver stimulants, such as oxgall, sodium succinate, and acid sodium oleate, which are effective through stimulation of the liver and not as direct laxatives or cathartics. The use of four to six ounces of oil injected into the rectum at night the last thing and held until morning is a most effective measure, particularly in the class of cases due to dyschezia of the rectal type of constipation.

There are certain articles of diet in which patients suffering from constipation should never indulge and among those which are particularly interdicted are puree soups, rice, sago, farina, cream of wheat, cheese, chocolate, cocoa, cranberries,

huckleberries, claret, and red wines; white wines may be used in moderation, if obtainable.

Of course, before going to bed the patient is instructed to exercise, using the abdominal exercises so familiar in the United States Army; or the shot bag principle of exercise. One important point to bear in mind in treating these patients is insistence upon their arising at the same time every day and taking their meals at the same time, thereby allowing the automatic functions to become once more regular in their activity. As has been hinted, extremes of temperature, either hot or cold, are extremely valuable as stimulants to bowel motility.

To the patient who has difficulty in consuming a sufficient amount of food we have found that the caloric method of feeding is applicable. By these lists the amount of food equal to 100 calories is readily determinable, and then the patient is instructed to eat a unit of calories a day, consuming 2,800 or 3,000 calories, and he is instructed to keep a list and to always eat the exact amount. If the patient does not gain weight by this method, or his general condition does not improve, by an increase of 200 calories in the daily intake at the end of each week an increasing amount of food can be forced upon him until a sufficient residue is left in the intestine to stimulate bowel movement.

To patients who are somewhat stubborn, the use of a rectal dilator inserted when they begin to dress in the morning and left in the rectum until a desire for bowel movement is induced is usually very effective. This is particularly so in cases of contracted spastic sphincters. Often a similar result can be obtained by the use of a gluten suppository; and often we have large suppositories made of cocoa butter which produce similar results.

In all work on dietetics at the present time we should not forget the part which the vitamins play. In the diet which has been outlined there is no lack of vitamins because of the fact that the diet is fairly well balanced and also because much raw food is consumed during the intake of the meal. Vitamins are readily supplied to the body in yeast, and we sometimes advise patients to eat half a cake of yeast three times a day, the yeast being stimulant in its nature to intestinal motility. Cabbage and potatoes are other splendid sources of vitamins (2).

In all cases of constipation the question of focal infection in any part of the body should not be forgotten and efforts made to eliminate any foci which may be present. We must also bear in mind that venous congestion incident to improper circulation in the intestine allows of abnormal invasion of the system by bacterial products and bacteria. Therefore, various electric modalities applied to the abdomen are extremely valuable in the way of stimulating the circulation and improving the general tone of the intestines. However, in the event of elaborate electrical apparatus not being at hand, the increased intake of food by a deposit of fat in the abdomen, aided by the increased vitality of the anterior abdominal wall, will produce a condition of increased intraabdominal pressure which will tend to return the circulation to normal.

To secure any success, every laxative measure

must be avoided, and often it must be insisted that the patient go for even forty-eight hours without a movement, at the end of which time a desire usually materializes, and from that time on, with a large bulky diet, frequently a normal condition of bowel movements results at once.

Grahams axioms (3) should be borne in mind. First, no case of chronic constipation is diagnosed or should be treated until a thorough proctological examination has been made. This consists not alone in the use of the proctoscope, but a digital examination should be made of every rectum, the whole secret of success in the treatment of the case being found at this time. There is an old adage that the difference between a gastrointestinal specialist and a general practitioner is the fact that the gastrointestinal specialist made a rectal examination; but with the advances which are constantly being made, we realize that more and more detail and care are being given to our patients, and the examination of the rectum is not overlooked as it has been in the past.

The previously outlined dietary principles are based upon broad phases, and failing in success, the diet has to be made typically applicable to various gastric and intestinal conditions, of which may be mentioned the type of stomach where no free hydrochloric acid is secreted with the attendant lack of activity of the enzymes, to the opposite state of affairs where pronounced hyperacidity is present; and let me mention the fact that in cases of gastric catarrh with diminished acidity a tendency of diarrheal conditions is prone to occur, whereas in constipation there is more likely to be hyperacidity. This will not follow in all cases, but we should realize that with the falling off in efficiency of gastric digestion there is a correspondingly deficient function of the liver and pancreas, and the absence of these two essential digestive factors in the intestine promote an undue fermentation, and, as a result, gastrogenic diarrhea occurs.

Another type of case which must be emphasized is that due to spasmodic colitis where there are abnormal spasmodic contractions, multiple in number, throughout the large intestine. This condition is usually accompanied by an increase in the production of mucus and gives rise to the condition which is known as mucous colitis. Formerly, the Austrian clinicians felt that this was an irritative condition and should be handled by an extremely bland diet, no irritative foods being given, and a diet similar to an ulcer diet being prescribed, hoping thereby that the points of irritation would disappear and that normal peristalsis would occur. After extensive experiments with the bland diet in constipation it has been practically discarded, and we attack this type of spasmodic colitis with the diet previously outlined.

These cases, as is true of many other cases of constipation, must be treated intelligently, and the patients should be informed that they may have a period of a few days of increased discomfort while their functions are becoming regulated, but that if they will have the courage to follow your instructions over a period of a few days normal results will ensue.

The only auxiliary measure allowed in these cases is a small enema in the morning after they have passed a day without a bowel movement, and the important factor is that this enema should be given at the time of normal bowel movement; that is, directly after breakfast. With this enema normal habits are usually established, and it is to be resorted to at infrequent intervals.

CONCLUSIONS.

1. Constipation is a preventable disease.
2. The pronounced causal factors are carelessness and laziness.
3. Plenty of water should be drunk to supply the necessities of the body.
4. There should be absolute regularity in the time of stool.
5. Dietetic principles should be applied with intelligence and the etiological causes thoroughly understood.
6. Cathartics will not cure constipation, but are positively sure to aggravate the condition.

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- 300 McDONOUGH STREET.

CHOLEDOCHITIS, CHOLECYSTITIS AND CHOLELITHIASIS.*

The Need of Early Diagnosis and Treatment.

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(Concluded from page 27)

DIAGNOSIS.

Diagnosis is then developed around the direct study of the bile and the manner of its discharge—the promptness with which A and B biles appear, the amount of B bile and the steadiness or the intermittency of its discharge, suggesting normal tonus, subtonus or hypertonus of gallbladder musculature and giving inferences as to its capacity; on the gross appearance of the several biles, color, consistency, viscosity, transparency, turbidity, flocculations, mucus, etc., and especially the careful examination into the cytology (epithelium, whether bile stained, its source, pus, leucocytes, crystals, concretions, red blood corpuscles, inflammatory debris, mucus, bacteria); into the chemistry (lecithin, cholesterin, calcium, pigments, effervescence on acidification); and into the bacteriology by culturation of each of the segregated samples of bile.

The bacteriological examination must be carefully conducted and promptly done to prevent streptococci and other less hardy organisms becoming overgrown with the more rapidly growing colon groups, *Bacillus pyocyaneus* and *Bacillus subtilis*. Cultures should be made at the time of the withdrawal of bile in the office, clinic or hospital, and planted in glucose broth flasks, blood agar tubes

and a third sample put in a sterile test tube, labeled and promptly sent to the pathologist or bacteriologist unless you are qualified to do the work yourself.

I have learned that I get more reliable cultures from planting the mucopurulent flakes, especially when heavily bile stained, which sink down to the bottom of the bottles, particularly those of B bile. These mucopurulent flakes, lifted out by a sterile pipette, are representative of material from the floor or walls of the gallbladder, ducts, or duodenum. Microscopically they show by far the most interesting and conclusive cytological condition. If more cultures were taken at operation from the gallbladder, from the mucopus from the floor of the gallbladder and not simply from the supernatant bile, I believe the average of positive cultures would be much higher, whether the gallbladder showed gross pathological changes or not. Withdrawing bile by a sterile hypodermic needle and syringe often gets the supernatant bile only. I wish to emphasize the need for careful cultural technic and prompt examination. Much important differential diagnosis hinges on this.

Again I would like to point out that it may be possible to decide where the source of the maximum infection may be, even though A and B, or A and B and C biles all deliver, say, streptococcus and colon bacillus, by taking advantage of colony counts. For instance, if you plant loopfuls of A and B biles and sow them through blood-agar petri plates and find that A bile grows seven colonies and B bile ninety-four, it is reasonable to conclude that the major source of the infection is the gallbladder and not the duct. Similarly, if the colony counts from C bile are far larger than A or B, the liver is to be suspected of being infected.

This plan is working out well and checking up well in differential diagnosis. I do not see now, however, how we can ascertain definitely whether or not the wall of the gallbladder or of the ducts, or the duodenal mucosa is definitely infected beyond the possibility of recovery by free drainage and topical treatment and sensitized vaccines. These direct diagnostic findings can, therefore, be used to amplify or to interpret the information secured from the history, the physical examination and from special examinations, such as the x ray, stool, stomach and blood.

We can thus hope progressively to modify in the future the one time true statement of Stockton (10): "It is difficult to reach a clinical knowledge as to the amount of bile that is being passed and as to the various constituents of the bile," and the statement of Smithies (11): "The average textbook considers cholecystitis in a vague uncertain way, as though it were not an ailment second in frequency to all intraabdominal disease only to lesions of the appendix. Commonly cholelithiasis meets recognition as an acute dramatic, abdominal crisis, in which the chief rôles are played by colic, chills, fever, sweats, and jaundice."

The differential diagnosis between cholelithiasis and cholecystitis depends to a large extent on the bacteriology and cytology plus the gross normality or abnormality of the bile. This will be referred

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to in greater detail when the diagnosis of atony of the gallbladder is discussed. Of course, if the gallbladder has previously been removed the problem is easier. Empyema of the gallbladder is easiest to diagnose directly, provided the gallbladder is mechanically able to discharge a specimen of its contents. Dr. Brown, of Montana, recently told me that he had examined some seventy or more suspected gallbladder cases by this method. Among them were four cases of empyema successfully and directly diagnosed and two of the four he had successfully drained and tided over acute complications that did not warrant the risk of surgery at the time.

CHOLELITHIASIS.

Regarding the diagnosis of cholelithiasis, some helpful points can now be suggested. Of course, the recovery of gallstones themselves is the *sine qua non* of this diagnosis. I have recovered small concretions through the duodenal tube in one instance, and on several other occasions have made stones pass either out of the gallbladder or out of the duct, stones too large to be recovered by tube but found on sieving the stools. In none of these cases, however, do I feel that this would have happened at the time of diagnostic drainage if magnesium sulphate introduced locally did not possess the power to relax the sphincter and to contract the gallbladder wall. Why it loses much of its power to do so if first passed across the gastric mucosa, as Meltzer first noted and which I have confirmed, I cannot explain, but such apparently is the case.

Next in importance to direct recovery of definite gallstones, gallsand and the sense of grittiness to the finger suggest the calculus forming possibility. So does the microscopic finding of large agminated masses of precipitated crystals of bile salts or pigments, since it suggests that the liver cell has lost the power to hold these substances in solution, as occurs in the formation of liver or hepatic duct stones, or that the bile in the gallbladder has become so static that excessive concentration and crystallization has taken place. I have previously shown that the sudden dense turbidity that one sees taking place in an otherwise perfectly transparent bile during a drainage is due to a sudden spurt of acid gastric juice entering the duodenum and mixing with the bile. This was confusing at first and is still annoying. Dr. Bartle, working with me, found that this turbidity could be artificially produced in the case of every clear bile by artificially adding dilute hydrochloric acid. The turbidity varies according to the strength of the acid and the chemical constituents of the bile. Later certain clear biles were encountered in which an effervescence as well as the turbidity was produced on adding hydrochloric acid, similar to the reaction of acetic acid and calcium carbonates in the urine, and the question has been suggested as to whether this might mean the possibility of potential or formed calcium carbonate stones in the gallbladder. More work must be done on this point.

ATONY OF THE GALLBLADDER.

Relative atony of the gallbladder is something I believe we can diagnose and which I consider to be

of extreme importance because I believe it to be one of the earlier phases of gallbladder disease and the forerunner of gallstones and of gallbladder infections. This diagnosis is suggested in three ways:

1. The recovery of static or off color bile, ranging from the deeper shades of golden yellow, into the green yellows, green blacks, and blacks, and possessing an increasing viscosity from that of a thick syrup to that of tar. Where the viscosity is heavy and the cytology shows much mucus and desquamating masses of bile stained, high columnar epithelium, and quantities of precipitated crystals, I consider this an atonic catarrhal cholecystitis and a potential forerunner of calculi. I have seen this type alone as well as the type of infected cholecystitis with a swarming bacterial flora and pus, blood and inflammatory debris. This is the outspoken type giving rise to well marked clinical symptoms. But I have also frequently seen the masked infective cholecystitis with swarming bacteria and static bile, but no cytological inflammatory reaction or marked cellular destruction. These are the cases that are early, do not show interpretable clinical symptoms, but give rise to the vague atypical dyspepsias, and these too are the cases which operatively are passed over as grossly normal and in which the appendix is removed and the masked focus left to breed pathological conditions.

2. In the amount of static bile recovered. If a gallbladder's normal capacity may be considered two and a half ounces, and if four ounces of this type of bile can be recovered in bottles, it seems reasonable to assume that the gallbladder in question must be functionally atonic and unable to move its contents promptly or the cystic or common ducts must be partially obstructed. If six to twelve or more ounces of this static bile is recoverable (as in my series of cases), it must appear that the normal distensible sac has been overdistended, has become dilated and has perhaps ruptured some of its muscle fibres and may be progressing to an absolute atony. The functional type of relative atony seems to fit in well with many of the cases presenting symptoms of so-called biliousness and of cyclic migraine attacks. These also are groups that may be the forerunners of gallstones and pathological gallbladder conditions.

3. In normal cases when B bile is recovered it comes continuously until replaced by the appearance of C bile and averages from one to three ounces and further stimulation with magnesium sulphate fails to recover any more. Whereas, where atony is suspected, B bile appears, the bile is static to varying degrees but gallbladder discharge may be intermittent, that is, two or three ounces of B bile and then ten to thirty c. c. of C bile and again two, three or four more ounces of static B bile. Furthermore it is possible to deliver more of this type of bile on restimulating with magnesium sulphate. It is reasonable to suppose that such gallbladder musculatures are deficient in tone and incapable of emptying completely, as in atony of the urinary bladder, with its residual urine. Of course, there are limits to the amounts of magnesium sulphate that should be used. I think a safe

limit might be placed at ninety c. c. of thirty-three per cent. representing thirty c. c. of the saturated solution. My custom is to start with seventy-five c. c. and note how much I recover in the first bottle unmixed with bile. If I recover, say forty c. c. I can then restimulate to the amount of fifty-five c. c. additional and still keep with the limit of ninety c. c.

It may be as well to mention here the fact that in many of these cases we are draining highly infected material from the biliary passages and that some of this fails to be aspirated into the bottles and passes down the intestines possibly to infect susceptible zones lower down. There are two logical ways to overcome this. First, by douching the duodenum with various disinfecting solutions, potassium permanganate, silver nitrate or possibly chloramine-T, and get back what one can. I personally do this, but do not advocate it for any one beginning duodenal work of this kind, for it has an element of risk, because it is by no means certain that you can get out again what you put in. Secondly, to hurry along the infective material as rapidly as possible through the intestines. To do this I always follow each biliary drainage, whether for diagnosis or treatment, with a duodenal enema. I prefer Ringer's solution, for its healing qualities, reinforced by a five tenths per cent. or twenty-five hundredths per cent. sodium sulphate depending upon how much magnesium sulphate solution has failed to be recovered. The total amount of the duodenal enema I keep at 250 c. c., introduced at 105° and require at least twenty minutes for its introduction. This is usually effective in producing a large fluid or semifluid bowel movement in from fifteen to ninety minutes. Furthermore, no patient leaves my office without being given a cup of bouillon and some crackers. This tides them over the faintness of hunger and free intestinal evacuation.

I wish to refer now to the diagnostic inferences that might be possible in the failure to obtain B or gallbladder bile. They are so obvious that they merely need tabulation.

It might indicate any of these possibilities: 1. Obstruction of cystic duct, by a, stone or stones, b, adhesions or angulations or stricture, c, pressure from without, tumors, lymphatic glands, or, d, inspissated mucus, hydrops. 2. Gallbladder contents, may be entirely calculi and no, or relatively little, bile. 3. Weakness of gallbladder musculature, atony, dilatation, too weak to move its fluid contents. 4. Tarry bile, ultrastatic, too thick to flow. 5. Fibrosis of the gallbladder.

TREATMENT.

This method during the past three years has been successfully used in the treatment of all of the states of biliary diseases mentioned in the following paragraphs. Three years is too short a time to predicate an opinion as to the ultimate possibilities this method of nonsurgical biliary drainage may possess. Its principles are soundly established and are logical. Furthermore, one is able to gauge progress made by the improvement in direct objective findings in addition to the usual method of estimating clinical and symptomatic improve-

ment. The ultimate criterion of a cure in the real sense is more nearly within our grasp.

We are mechanically applying the surgical principles of free drainage for infected sacs, tubes and tissues, of free drainage for catarrhal states of inflammation of various grades but without infection, of free drainage for gallbladders that are atonic and contain static bile in which sooner or later there develop stones or a more serious pathological condition, and while applying surgical principles we are doing it nonsurgically and avoiding certain surgical risks. Besides this, and even more important, we are preserving tissue which may possess a power of recovery of function beyond our present conception. Patients suitable for this method of treatment should be selected. Its real sphere of usefulness lies in giving a direct method of treatment in early stages of disease, diagnosed early, before gross pathological changes have taken place. Removal of pathological tissue, of gallstones, etc., must be left to the surgeon. Our aim should be to learn better to diagnose the beginnings of these diseases and to institute promptly direct, rational and safe measures of treatment. We may legitimately hope that this method, if intelligently applied, may decrease the number of cases requiring serious and dangerous surgery.

TECHNIC.

The technic of treatment is not difficult and can be carried out by hospital interns and even by nurses after a little practice. It does not require the expert supervision of the highly trained specialist, although it is naturally better if such service can be secured. Here it differs at once from the necessity of procuring the most skillful surgeon for surgery of the upper right quadrant of the abdomen. This is not the field for the occasional operator. It is time that we recast some of our accepted views. To operate and have the patient live and to operate and make the patient well are two very different things. It is one thing to cut out pathological tissue and quite another to restore pathological physiology already existent, or that created or increased by the operative procedure.

The technic of this treatment is easy but it is the skill in the general diagnosis and the technic of handling the minutiae of special diagnosis that require the highly trained specialist, and the better his training in pathology and physiology and the keener his enthusiasm for the use of the microscope, the test and culture tube the more valuable will be his opinion.

Simple catharrhal jaundice may be treated very satisfactorily by this method. The duration of jaundice in the ordinary case may be cut in half and potential drainage to the ducts, gallbladder and liver may be prevented. Recent papers (12) have shown what can be done in the treatment of this condition by this method.

Cholelithiasis and cholangitis may be successfully treated in favorable cases, especially where there has not been any surgical interference. That means the relatively early cases. Even in late cases where there has been well established pathology and several preceding operations this method may give an un-

expected brilliant result. This was evidenced in one young girl whose case I have reported at length (8). She had three major and one minor gallbladder and duct operations performed in three years with two further years of constant suffering and remittent exacerbations of choledochitis, finally culminating in a very severe and acute attack, with complete duct obstruction, chills, fever, sweats, high leucocytosis and toxemia, yet her condition, with its very serious aspects, responded splendidly to this method of attack, and today the girl is well and has remained free from any further exacerbation for nearly three years.

I have within the week seen a young woman of twenty-six who had her gallbladder and stones removed twenty-three months ago; she had two weeks of surgical tube drainage and nearly four months of dressing drainage. She remained free from symptoms for just two months, when exacerbations recurred and during the past eighteen months she had had an equal number of attacks of severe colicky pain which two weeks ago culminated in chills, fever, and acute obstructive jaundice. Unless her common duct can be speedily unplugged dilatation of the ducts and biliary cirrhosis may develop because her safety valve, the gallbladder, has been removed. It is more difficult to unplug such a duct when the gallbladder has been removed, because the contraction of the bladder supplies a good part of the *vis á tergo*. It is remarkable to what extent the gallbladder can distend, as witness the case of the little girl at Johns Hopkins Hospital, recently reported upon, whose very distended gallbladder contained nearly a litre of bile.

What I have said of choledochitis applies to cholecystitis, perhaps if anything more favorably. Especially so in the early cases, such as those complicating typhoid fever, and masked focal infections of the gallbladder. This is the time to diagnose and to drain, nonsurgically, in such cases and not wait for the development of a full blown pathological condition.

Empyema of the gallbladder has been successfully treated during its acute phases in patients who presented severe cardiorenal contraindications for surgery. That is to say, their gallbladders have been drained successfully, the maximum source of their toxemia has been temporarily removed, and they have been tided over to a point where corrective surgery for the removal of the pathological condition could be more safely practised. There is nothing to prevent the success of nonsurgical drainage in empyema provided the cystic duct is patulous. This is by no means recommended as the method of choice but as a possible alternative measure worthy of trial in selected cases presenting grave surgical contraindications.

Cholelithiasis remains entirely beyond the scope of this method, although stones have been made to pass through the common duct. Our efforts should be directed to the detection and treatment of the early states of pathological physiology and to the prevention of calculi. The method has, however, distinct merit as a postoperative follow up treatment to prevent the reformation of stones and to continue to drain, *ex corpore*, still

infected bile beyond the limits afforded by surgical methods of drainage. This has been proved a successful measure.

The one field where this method can be strongly recommended is in the treatment of biliary stasis or faulty retention of gallbladder bile. If more cases of biliousness were investigated by this method it would surprise many of you to find the gallbladder atonic to varying degrees and unable to discharge its static bile. These are the patients in whom, if they are left to themselves and their cholagogues, a quarry of stones will develop. These patients do extremely well and it is remarkable to see their improvement in color, digestion and bowel function. They lose their lethargy and recover their sense of wellbeing. Many of these atonic gallbladders are harboring pathogenic microorganisms but still preserve sufficient mucosal resistance to prevent infection of their walls. This is the time to treat them energetically by frequent drainage. Bacterial identification should be carefully made and autogenous vaccines have an important place of usefulness. It is very important to search back for primary foci of matched bacteriology in the teeth, tonsils, sinuses, bronchial tract, stomach or duodenum and remove them. Many of these cases of biliary stasis are associated with various forms of migraine. Some of them respond almost miraculously to biliary drainage; others are very resistant, suggesting a different causative factor.

SUMMARY.

To sum up in a few words, this method has already achieved a position of importance in the diagnosis of biliary diseases. In the field of treatment it is certainly the method of choice for biliary stasis, gallbladder atony, and in the early states of catarrh and infection. It may be found to decrease the incidence of stone formation and thus of cancer of the gallbladder. It will decrease the tendency to damage the pancreas and liver. It may decrease the frequency of acute and chronic pancreatitis, of biliary cirrhosis and possibly diabetes. It may have a place as an alternative method of treatment for some of the surgical groups presenting operative contraindication. It certainly is useful as a post-surgical followup plan of treatment in many cases.

More time must elapse to prove its final evaluation. Quite true, but one must start somewhere. It has had a good beginning. It may go further. It is within my province to call your attention to it, and within yours to prove that it has the merit which I believe it to possess.

As to future possibilities, it offers an attractive opportunity for further direct clinical investigation into and the interpretation of: 1. What are the cholagogues? How do they act? a. By increasing liver secretion of bile or the velocity of its discharge? b. Do they empty the gallbladder? 2. Precursory states and phases of gallstones and infections, i. e. biliary stasis and atony. 3. Parallel studies on pancreatic secretion, velocity of elaboration of ferments and their discharge. What are the elective pancreatic secretagogues? Have they a place in the prevention and treatment of diabetes? 4. Extending the scope of chemical investigations into the composition and physical properties of bile.

Here are many usefully important problems awaiting solution.

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PEPTIC ULCER.

Clinically and Röntgenologically Considered.

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The refinements in diagnosis of peptic ulcer have not only facilitated the detection of this intractable disease, but have broadened our views and clarified our understanding of the varied pathological manifestations. The functional gastric neurosis to which our older textbooks devote chapters are today seen in a different light, and many of them can presently be interpreted on pathological bases. The so-called Reichman disease, spoken of as a functional hypersecretion, is today better understood as hypersecretion concomitant with duodenal ulcer. Hyperacidity is no longer regarded as simple or functional hyperchlorhydria, but can invariably be accounted for, and if not resulting from gastric disease, perhaps arises reflexly from a lesion of a remote abdominal organ. Such able workers as Mayo, Smithies, Einhorn, Hamburger, Case, Cole, and others in this country; and Moynihan, Forsel, Hau-deck, Holz-knecht, Rieder, and Retzius abroad, have enriched the literature, each adding something to pathogenesis, diagnosis, or treatment.

The symptomatology of ulcer has been considerably popularized at present, so much so that every physician is on his guard when confronted with a symptom complex of gastric complaints. Moynihan has said that a diagnosis of duodenal ulcer can be made by correspondence. While a case presenting classic symptoms may be recognized with ease, yet it is only by careful analytical study embracing the subject broadly that conclusions approach correct diagnosis can be reached. The borderline cases are still in a maze of complexity, and create many doubts, especially so when the conscientious surgeon is confronted with exploratory laparotomies in these obscure cases.

An attempt will be made in this article to cover briefly the most important data at present utilized in the diagnosis of peptic ulcer and to discuss their

merits, as well as the modern conception of etiology, pathology, symptomatology, and disturbed motor and secretory functions. There are three main factors to be considered. Enumerated in the order of their importance, they may be cited as follows: 1, anamnesis, or the clinical symptom complex; 2, röntgen examination; 3, chemistry of the stomach and intestines.

ETIOLOGY AND PATHOLOGICAL ANATOMY.

The etiology of peptic ulcer still forms a fascinating chapter in medical literature and though shy of complete solution, yet it is nearer the comprehensive goal. Many theories have been advanced and while there is truth in some, in others considerable contradiction outweighs the assertions. The modern conception of pathogenesis of peptic ulcer includes several factors which may be cited as follows: 1, spasm or neurogenesis; 2, infection, and 3, traumatism, whether mechanical, physical or chemical.

While the literature abounds in numerous data of experimental research work beginning with Virchow in 1885, most of these have but a historical interest. Virchow's theory of embolism or thrombosis causing circulatory interference in localized areas in the stomach wall, thus causing necrosis, ulceration and digestion, did not stand the scrutiny of later studies. The gastric vessels are not terminal and are rich in anastomosis. Furthermore, the age affected by ulcer is not one conducive to vascular changes. Even those ulcers, produced by Cohnheim and later by McCallum by the injection of finely divided suspension of lead chromate or ultramarine blue causing hemorrhagic ulcerations in the mucous membranes, apparently on the theory of circulatory interference, heal promptly like all other traumatic ulcers without the production of the typical round ulcer. Other experiments, such as obstructing the portal circulation, severing the vagi, or cutting various segments of the cord at various levels, have neither produced the so-called peptic ulcer nor have been conducive to any logical understanding as to the causation of this type of ulcer.

The problem that confronts us is to understand what particular pathological process takes place which leads to the formation of the typical round, punched out ulcer, with sloughing base and overhanging edges, the so-called classic peptic ulcer, the ulcer that is chronic and occurs at stated intervals. It must possess all these characteristics before it can be classed as peptic ulcer. It is well known that chemical ulcers, as well as other traumatic ulcers, do occur but heal rapidly without giving any of these recognized manifestations. Such cannot be regarded as peptic ulcer. As we shall see later on, there is another factor to be considered which tends to embrace such morbid processes.

Spasm.—The theory of spasm of the gastric muscles as a forerunner of ulcer has been mentioned by Talma and his pupil Von Yzeren. Strong evidence has been accumulated in recent years that place spasm as the most plausible factor in the causation of gastric ulcer. Eppinger and Hess, through their elaborate studies of the autonomic or vegetative nervous system and the disturbances attending vago-

tonia and sympathicotonia, have shown a close analogy between the symptom complex of ulcer and the many similar manifestations of the vagotonic state. They call attention to the local vagotonia where the various stimuli act upon the autonomic supply to the smooth muscle and secretory apparatus of the stomach and produce pathological states of the same nature as are found when the autonomic system is in an increased state of irritability. These are analogous to the subjective as well as many objective manifestations of gastric ulcer. In truth do we not observe clinically the symptom of pyrosis, sour eructations, fullness and pressure after meals, hunger pain in both conclusions? Do we not see under the fluoroscope the same hyperkinetic manifestations of deep peristaltic waves, gastrospasm with incisures, pylorospasm, and cardiospasm? Do we not find the same chemical changes of high acidity in both? And furthermore, are not the susceptibilities of the inherent biological properties, their reaction to chemical substances (atropine, pilocarpine) alike in both states?

Gross and Held point out the muscular distribution in the structure of the stomach emphasizing that the strongest musculature is where function is greatest and where spasm most abounds. The groove of Retzius is strengthened by the oblique bundle of fibres. The antrum and pylorus as well have the greatest muscular supply. It is in these regions that ulcer most frequently occurs.

Friedman and Hamburger produced acute ulcers in a series of experiments in dogs by the injection of five per cent. silver nitrate into the submucous tissue of the stomach. They succeeded in retarding the healing of these ulcers by ligation of the pylorus and thereby rendering them chronic. They deduce from their experiments that the delay in healing is greater when the food and gastric juice are ground against the ulcer with unusual violence. They conclude further that any acute ulcer in man which may be produced by abrasion of a coarse food particle or other form of traumatism will become a chronic ulcer when there is an associated condition of spasm. When we remember that pylorospasm results from an increased irritability of the autonomic nerve supply, or from reflexes of distal organs, supplied by the same nerves, the gallbladder, appendix, cecum, proximal colon, liver, and pancreas, it is easy to conceive how an abrasion in the mucous membrane of the stomach may become a chronic ulcer. Pylorospasm is usually associated with hyperacidity, hyperperistalsis, and impaired motility, and these are the factors that are the forerunners of and prepare the field for, the development of gastric ulcer.

Infection.—Rosenow states that the intravenous injection of streptococci of the proper grade of virulence (moderately high grade) may be followed by ulcer of the stomach and duodenum. The culture obtained was usually from infected tonsils in cases of articular rheumatism or from the base of an indurated chronic ulcer in man. These various strains, when passed a number of times through various animals until the proper virulence was obtained, sometimes produced ulcer after the fifteenth injection. All these ulcers appear very acute and show

evidences of a severe grade of infection by the inflammatory reaction, hemorrhages and rapid sloughing of tissue—often causing perforation. Simultaneously with these ulcers are found acute arthritis, myositis, nephritis and other evidences of a septic general infection.

From the foregoing paragraph one must conclude that the analogy between those septic conditions and peptic ulcers in man is still very remote. The link in the chain from this type of experiments has as yet not established the relation between infection and peptic ulcer.

John B. Deaver perhaps best sums up the infection theory, as follows: "The action of bacteria on the capillaries of the stomach causes an irritation and injury to the endothelial cells with an escape of blood into the submucous space. This later forms a localized abscess which discharges and leaves an ulcer base. The constant bathing in an acid medium tends to keep the ulcer chronic."

Traumatism.—Many have thought that traumatism in all forms, whether physical, mechanical, or chemical, can produce ulcers. Violence, such as that produced by repeated blows over the abdomen, has been said to produce ulcer. Tight lacing and occupations requiring constant pressure over the upper abdomen have been attributed as a cause of ulcer. Leube and Decker have shown that burning the mucosa of the stomach with hot food caused ulcer. W. J. Mayo states that the ingestion of hot liquid foods will cause ulcer. Such theories, while very plausible, can only be held accountable for ulcers on a limited area on or about the groove of Retzius close to the incisura cardica and down as far as the pars media. The temperature of the food is surely lowered by the time it reaches the pylorus on mixing with the secretions of the stomach and the chyme. When we further consider that seventy-eight per cent. of all the peptic ulcers are contained in the duodenum within the postpyloric regions, surely this form of trauma cannot be held responsible for the large field of peptic ulcers.

Hyperacidity and autodigestion.—Attention has been drawn to the fact that peptic ulcer is found only in that portion of the digestive tract where the presence of hydrochloric acid is found. A great deal of importance has been attached to the hyperacid gastric juice. Pavy, Samuelson, and Matthews have retarded the healing of ulcer by irrigating the stomach of a dog with a 0.56 per cent. solution of hydrochloric acid. The action thus produced would be a corrosion of the superficial layers of tissue immediately followed by the digestive act of pepsin in the acid media. The question as to why the stomach does not digest itself in toto has been answered by Weinland who attempted to prove the presence of a living antiferment in the living cells of the stomach thus protecting the ferment action of pepsin. Weinland thinks that the inability of a localized area of tissue to produce antipepsin in a hyperacid medium causes local digestion and ulcer formation.

From this exposition of the etiology of peptic ulcer we must conclude that there is always present a predisposing factor consisting of an increased irritability of the autonomic nervous system. This state is a forerunner and acts as a receptive back-

ground. The inciting factor may be an abrasion in the mucous membrane which is produced either by a coarse food particle or any other mechanical, thermal, bacterial or chemical agent. When such superficial abrasion occurs under these favorable circumstances when bathed by the hyperacid and pepsin medium, when subjected to the constant grinding of the hyperirritable gastric musculature, and where pylorospasm and gastrospasm are constant factors, only under such states is it plausible to assume that a peptic ulcer with all its characteristics, may develop.

CLINICAL MANIFESTATIONS OR ANAMNESIS.

Moynihan says: "First and foremost (indeed if not exclusively) the anamnesis. Great importance must be attributed to a good clinical history. One should learn to acquire the art of elucidating the important symptoms of the patient's complaint. Patients often dwell on the least significant of the symptom complex and will mention subjective symptoms that have no bearing on their chief complaint." A great teacher, T. C. Janeway, often said: "Regard your patient as a witness; cross examine him as a lawyer would. The greater the art of your cross examination the more facts will you be able to gather from your patient." The type of patient, whether hypersensitive or phlegmatic as well as the degree of intellect, should be taken into consideration. His ability in interpreting and imparting his own complaints to the examining physician must likewise be considered.

The characteristic symptom, whose presence we must aim to ascertain, is pain. There must be pain in ulcer. Without pain there can be no ulcer. The pain is most often described as gnawing, boring, or burning. The pains are usually so spoken of at the highest stage of their severity. In the earlier stages the pain may not be so characteristic. A history can be obtained of an insidious onset, of a sense of distention or oppression, of fullness or weight in the epigastrium after meals. Associated with these, other symptoms make their appearance, such as pyrosis, eructation and waterbrash whose acrid taste often burn the throat. During this stage some will still pay little or no attention to these symptoms; others will seek relief in bicarbonate of soda which stops the discomfort by the expulsion of gas and neutralization of the acid. A sensation of choking in the throat which is often regarded as a neurosis manifests itself, which is none other than an indication of vagotonia concomitant with the general increase in the irritability of the autonomic nervous system occurring in ulcer. The periodicity of these symptoms, their seasonal appearance and disappearance, is rather striking. Patients will often say that they feel better during summer and are worse during early spring or late fall.

As the disease progresses intense pain makes its appearance, coming always at a definite interval after a meal and may be accompanied by the distress of distention or a 'blown-out' feeling. At times they occur in the form of abdominal cramps or may even simulate an attack of severe colic, necessitating the administration of a hypodermic injection of morphine. Several such cases are known to the writer and have clinically been mistaken by good ob-

servers for cholelithiasis when the x ray examination and the surgical operation revealed a penetrating ulcer. The intense burning may not always be spoken of by the patients in terms of pain. As is often observed in duodenal and pyloric ulcer, patients are awakened at night by an intense burning sensation in the stomach, so that they are forced to induce vomiting in order to obtain relief, yet they speak of this as burning but not pain.

Time.—These pains bear definite relation to the time of the intake of food. The time varies anywhere from one to three or five hours after meals. The nearer the ulcer to the cardia the earlier the pain. There are, however, exceptions to this rule. Late pains speak for duodenal ulcer; early pain coming on three quarters to one hour after partaking of food indicates an ulcer on the pars media of the stomach.

Hunger pains.—The appetite is usually good, often ravenous. The patients eat with a keen relish and enjoy their meals after which they experience for the first few hours a feeling of satiety and comfort. When the disease has lasted for some time, however, these patients begin to shun food for fear of the consequences. It is a daily occurrence to hear them remark that they would like to eat but are afraid when the disease has existed for some time. The sensation spoken of as hunger pain, which I would rather designate as hunger gnawing, should be differential from keen appetite, for this sensation is always present even in the patients who have lost their appetites. It is due to the hypersecretion present which is strongly hyperacid and is always present many hours after a meal when the stomach is ordinarily emptied. One often sees patients lean, haggard, with a dyspeptic facies, who have trained themselves to inanition and who have lost all desire to eat, yet in whom the hunger gnawing is always present and can be elicited on close questioning. These patients will then freely admit that they carry a few biscuits with them which they eat whenever this gnawing arises and are promptly relieved. Some patients take milk at night for the same reason, this likewise relieving them as soon as the acid is given an opportunity to combine with the food.

Location of the pain.—The location of the pain depends on the location of the ulcer. In duodenal and pyloric ulcers the pain is to the right of the midline or sometimes at the midline, and is referred upward into the right hypochondrium, sometimes to the right nipple, but never to the shoulder blade. When the ulcer is situated on the pars media or about the lesser curvature, the pain is referred to the left. If located on the posterior wall the pain is always referred to the back, and to the left of the spine. If a chronic perforation has taken place with adhesion to the pancreas the patient will always complain of a localized area of constant boring pain. (In one case a chauffeur attributed the pain to the pressure of a button on the back of his overcoat, on the left of his belt when leaning back on his seat).

Causation of the pain.—The belief that pain in ulcer is directly due to the irritation of the acid stills holds in the minds of many. This view is further strengthened by the relief obtained by the administration of alkalies. It is, however, of common knowledge that similar pains are present in

conditions of hypoacidity or even anacidity as achylia. Boas and others have long called attention to cases where the patients had obtained relief from alkalies and who had low acid values. The pain may also be relieved by the ingestion of a morsel of food, or water, or milk. Numerous experiments conducted by Hertz proved that instillation or irrigation with acid solution in ulcer cases in concentration as high as five tenths per cent. had no effect on inciting an attack of pain or aggravating the condition.

From these observations one cannot readily associate the acid with the primary cause of pain.

Modern advances in gastric physiology tend to the conclusion that ulcer pains are due to contraction of the stomach, pylorus and possibly the first portion of the duodenum. Hertz attributes epigastric pain to tension of the gastric musculature. He demonstrated that inflation of the stomach by means of a balloon introduced into the cardiac end of the stomach, leads to the sensation of fullness when the intragastric pressure rises to ten to fifteen mm. of mercury. Active or exaggerated peristalsis in a hypertonic organ causes increased tension and excessive intragastric pressure. The increased tension of the musculature of a stomach rendered irritable by disease gives rise to pain. By the balloon and x ray method of examination it has been observed that pain was always synchronous with the gastric and pyloric contractions. The subject under observation would always press a key as a signal of painful sensation, which would always correspond with the height of the contractions. Physiologists have further proved the presence of tonus changes and rhythmic contraction in the fasting stomach. Boldyreff in 1905 reported hunger contractions in dogs. Cannon and Washburn observed the same in man. Carlson classified the various types of contractions and tonus changes. He describes hunger contractions as powerful peristaltic contractions which arise at the cardiac sphincter and sweep down to the pylorus, increasing in strength as they proceed. Rogers and Hart in their röntgen examinations of a bismuth coated balloon introduced into the fasting stomach, also described the hunger contractions as vigorous peristaltic waves beginning at the cardiac end and sweeping over the whole stomach. The rhythmic contractions would occur at intervals of twenty minutes, and would always be associated with the sensation of hunger. We thus see that the pangs of hunger in the normal states are due to the periodical contractions and are synchronous with them.

The similarity of moderate ulcer pains to the strong hunger pangs in the normal person has long been observed clinically and led Moynihan to designate them as hunger pains. In diseased conditions, such as ulcer, the stomach is in a hyperirritable state, and any condition that will give rise to increased peristalsis will cause an increased tension and intragastric pressure resulting in pain. The acid plays a secondary rôle as it merely serves to stimulate contraction. The ulcer base in the deeper strata of the stomach contains sensory nerves which are not found in the

mucous surface of the stomach. When the ulcer is bathed in a medium containing free acid, whether of low or high concentration, increased peristalsis will result. Any other irritant, such as alcohol or a coarse food particle, will do the same.

An excess of acid in the duodenum, as emphasized by Hertz, prevents relaxation of the pylorus. This induced spasm of the pylorus and first portion of the duodenum by inhibiting the pyloric reflex adds to the increased tension resulting in hypertonus, hyperperistalsis and a marked increase in the intragastric pressure and pain.

The time of the occurrence of the pain is interesting as it adds additional weight to the factors entering into the causation of pain. It has been observed that the contractions are greater when most of the meal has passed out of the stomach several hours after the ingestion of the meal, the stomach being more than half empty. With the small calibre stomach the tonus is greater. The contractions are greater due to higher concentrations of the acid which occur at this time. The free acid remains uncombined, as most of it has already combined and passed out. In cases of hypersecretion the quantity and concentration constantly rise and one can often see, late in the digestion, the stomach full of secretion, with intense spasm and all the other previously mentioned pain producing factors. The relief from pain by alkalies is believed to be brought about in several ways. Some regard alkalies as a direct sedative to muscular contractions, that contrary to the acid, inhibit muscular contractions. However, it is well known that by neutralizing the acid, the stimulus to contractions is at once stopped. The pylorus becomes relaxed and the first portion of the duodenum becomes less irritable due to changes in the reaction on the chyme.

In conclusion it may be said that pain is due to: 1, muscular contractions when the stomach is in a hyperirritable state; 2, increased tonus; 3, increased intragastric pressure. The portion most irritated is the pylorus and the first portion of the duodenum. The time of most marked irritation is later, during digestion, when the stomach has more than half emptied itself, thus approaching the tonus changes and rhythmic contraction of the hunger state; 4, the acid as a contributory agent causes pain indirectly by stimulating contraction; alkalies control pain by inhibiting contraction and neutralizing the chyme.

(To be continued.)

Radium or Röntgen Ray Treatment.—William J. Young (*International Journal of Surgery*, April, 1920) states that there are definite fields of usefulness for radium and the röntgen ray both singly and collectively. Earlier recognition of diseases amenable to these agents and greater proficiency in their employment will result in a more comprehensive understanding of the indications, contraindications and limitations. The radiotherapist should be adequately trained in the diagnosis and clinical course of affections responsive to these agents as well as the technic of their application and the reactions which may be expected.

VOMITING FROM A SURGICAL VIEWPOINT.*

BY A. WIESE HAMMER, M. D.,
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Thrown daily into contact with many surgical conditions and affections, I have been for some time past impressed with the fact that, while medical and surgical literature is not likely to regard vomiting as a symptom of special diagnostic import, my object in presenting what I may term these stray thoughts, is to invite attention to the subject of vomiting as forming, in not a few instances, a very important factor in the symptom complex of some of the major surgical maladies. In a brief exposition, such as this, it would be irrelevant to rehearse the undisputed facts of the physiology of vomiting; and to include a tabulated list of diseases engendering vomiting, the result of bacterial toxins in the blood, such as scarlatina, or diseases caused by poisons of nonbacterial origin, such as anemia, or to dwell upon the vomiting of pregnancy or emesis of gastric origin, would be superfluous.

In a consideration of this all important subject, in taking a superficial survey, we observe vomiting as merely an insignificant symptom at one end of the scale; at the other end, this ominous factor is a forerunner of death. Thus, we will first note briefly the nature of habitual vomiting, and then pass in review some of the more serious maladies, especially of a surgical character, in our effort to disprove the oft repeated assertion that the symptom of vomiting has little clinical worth, and for all practical purposes may be quite disregarded.

Let us first consider the matter of habitual vomiting, that peculiar condition which baffles explanation, usually occurring in females, apparently without cause and independent of organic disease. Food may be ejected in the midst of a meal or in the interval between meals. There is no esophageal spasm and no regurgitation of the stomach contents. Many clinicians assert that the condition is catching, and they place this peculiar entity—or perhaps non-entity—in the same category as habit chorea. This vomiting is to be differentiated from hysterical vomiting and from gastric neurasthenia. Taking this as the initial form of vomiting, and omitting mention of its occurrence in many conditions and maladies, we may with benefit at once discuss this symptoms as found in association with cerebral disease.

In acute or chronic cerebral lesions, vomiting may be absent or appear only at rare intervals, and it may not be attended with nausea. When it does occur, it is absolutely independent of food ingestion, is projectile in character, it often occurs in the early morning hours, and the tongue is not coated. The head cannot be raised from the pillow without incessant vomiting, although other symptoms are entirely dormant. Vomiting from cerebral conditions may at times occur when digestion is at its height and

closely simulate a case of indigestion, as in a sudden apoplectic seizure. It is thus almost impossible to determine its true character; but the age of the patient should be given serious consideration, and this important practical fact should always be borne in mind—that no matter how apparently simple an attack of vomiting may be, in a patient over the age of fifty, its oncoming should be regarded with suspicion. Sudden vomiting occurring in a middleaged person, or in a patient of advanced age, the emesis being painless, with or without nausea, with no evidence of gastric involvement, the ejected matter being made up of mucus or a watery fluid, should at once strongly suggest the likelihood of the occurrence of cerebral hemorrhage.

Such vomiting is not attended by the usual symptoms of relaxation, but the sthenic effects which usually attend apoplexy are present. If the usual collapse symptoms occur in persons of fifty or older, the affection is more likely to be of uremic origin. If the respiration be altered in rhythm, or of normal frequency, or slowed because of the intimate relation of the vomiting centre and the pneumogastric centre, the cause is more likely a central hemorrhage. Hurried breathing attends vomiting from other causes. Whether vomiting in cerebral affections, especially the incessant vomiting associated with cerebral tumors, is due to irritation of a special centre in the medulla, whether from stimulation of the pneumogastric centre itself, or engendered by vertigo, the result of the auditory nerve disturbance, produced by stasis, needs further investigation.

We need scarcely be reminded of the peculiar nature of exophthalmic goitre, whose three cardinal symptoms are tachycardia, goitre and exophthalmos. One should be extremely careful in pronouncing a diagnosis in some instances, for it is a well known fact that the goitre may be small or absent and the exophthalmos may be late in developing. In recent cases, before treatment is instituted, the clinical picture is fairly uniform, but the symptomatology may be most misleading if the affection begins suddenly or develops slowly. This may be especially true when the gastrointestinal symptoms are among the earliest and are in the ascendancy, that is, when metabolism is increased, with subsequent digestive changes, nausea, vomiting, and long continued watery stools. This vomiting is believed to be partly of nervous origin. There are quite a number of cases on record where abdominal pain, watery dejecta, nausea, and vomiting, forming part of a symptom complex of exophthalmic goitre, had been hurriedly diagnosed by practitioners as indiscretions in diet.

Intractable vomiting often occurs in biliary colic, often no other symptom, save epigastric pain, being present during the first twenty-four or forty-eight hours. In other cases, the patient is restless, has an anxious expression, the skin is cold and moist, perhaps cyanotic, vomiting soon occurs—at first the contents of the stomach, and, if the common bile duct is not obstructed, bile and gallstones follow. After the stomach contents have been ejected, repeated retching usually occurs.

*Read before West Philadelphia Medical Association, February 24, 1920.

The primary nausea and vomiting of acute appendicitis is reflex in character, and manifested early in the invasion of the disease. Almost invariably it is the second symptom of the development of the malady, pain being the first. As a rule there are a few efforts at emesis and the nausea then passes away. It is produced by an overdistended condition of the appendix, the result of retained infected matter in that portion of the gut. The secondary nausea, and often persistent vomiting, are really caused by peritoneal involvement, and their nature and persistence resemble in every way rupture of the stomach or intestine into the peritoneal cavity.

This thought invites attention to the peritoneum, and in acute peritonitis, distention, or meteorism is one of the earliest signs. It is Nature's way of splinting the intestines to minimize the pain of peristalsis. With decrease of peristalsis and intestinal absorption, putrefactive changes are encountered, and the bowels become overdistended with gas. In order to free themselves from this overdistention, reversed peristalsis occurs, the contents of the upper intestine forcing their way into the stomach to be finally disposed of by vomiting. This vomiting, which is an early symptom, often continues through the course of the disease—at first the stomach contents are expelled, then bile, and later, the contents of the small intestines, giving the vomitus a thin, pale yellow appearance. Frequently, just before the oncoming of the fatal issue, the vomited matter is of a dark brown color, although at times it is flocculent and resembles partly digested food.

The importance of vomiting as a cardinal symptom is well illustrated in certain cases of hernia, where it and abdominal pain may be the only two factors to attract the diagnostician's attention. Thus, in every case of vomiting associated with abdominal pain, it behooves the examiner to seek carefully for a hernia, as a small knuckle of the intestines may have become nipped in the hernial sac and be sufficient for the occurrence of these two appreciable symptoms. In incarcerated or obstructed hernia, obstruction takes place by the damming of feces or undigested food, the fecal current, but not the blood current, in the wall of the bowel being arrested. Nausea occurs, constipation that is not absolute is the rule, for gas is passing by the rectum and the vomiting is not fecal. In strangulated hernia, both the fecal current and the blood current in the wall of the bowel are arrested, and vomiting is an early and serious symptom. It may cease for a day or two, and especially before death, the result of profound prostration. The early vomiting is reflex in character, later it is regurgitant. First, the alimentary contents are expelled, then the bile, and lastly, the vomited matter is stercoraceous. Vomiting is seldom encountered in inguinal hernia, more often in femoral hernia, and still more frequently in obturator hernia.

With these few remarks relative to occlusion of the bowels, we naturally pass to the consideration of intestinal obstruction, recalling for the moment that acute intestinal obstruction may be caused by strangulation, the result of bands or cords, intus-

susception, twists and knots, strictures, peritoneal pouches, slits and fissures, also abnormal contents, as biliary calculi and enteroliths.

The stomach contents are first vomited, then the bile, and finally the duodenal contents, at first odorless but a few days later becoming fecal in character. A lesion in the upper part of the small intestine is characterized by the rapid oncoming of vomiting of a violent and expulsive nature, while obstruction of the large intestine exhibits vomiting as a later symptom, following generally tympanites, or, as is often the case, there may be eructations of gas without vomiting. The fecal nature of the vomitus in obstruction of the large intestine is to be ascribed to the regurgitated matter from the upper bowel, as there is no evidence to warrant the belief that the contents of the large intestine are ever vomited. In intussusception, fecaloid vomiting is the rare exception and certainly never the rule.

In connection herewith, it is of interest to note that a mere narrowing of even a small part of the intestine is only necessary to offer many of the cardinal signs and symptoms of total intestinal obstruction. Many years ago, Dr. William T. Smith, (1) professor of physiology in Dartmouth College, encountered a case of uncontrollable emesis in the person of a young woman, whose history at the time and whose past history failed to throw any light on her malady. The patient had no fever, there was no abnormality found upon urinary analysis, there was no local soreness; physical examination of all the organs was negative, and there was neither functional disturbance nor organic disease of the uterus, ovaries, or the appendages. For three weeks, nevertheless, there was headache with uncontrollable vomiting which later became fecal. By means of enemata, slight liquid discharges were noted. Dr. Charles B. Nancrede was called in consultation, a laparotomy was decided upon, but the operation failed to disclose the nature of the suffering. The patient died the next morning and at the postmortem examination a portion of the ileum, one inch long and five feet from the ileocecal valve, was found somewhat narrowed, apparently by cicatricial contraction, and the surface of the thickened membrane suggested distinctly a healed ulcer.

At this point it seems pertinent to the subject under review to say a word concerning regurgitant vomiting, followed the operation of gastroenterotomy. Because of improvements in surgical technic and a better understanding of abdominal surgery, this deplorable sequela is much rarer today than in times past. It is the result of one of several causes, or it may be due to a combination of factors, which result in a true, acute, intestinal obstruction. Prominent among these causes we may mention a too free and careless handling of the intestine, a kinking of the bowel at the point of anastomosis, and too firm a pressure caused by faulty clamping.

In concluding this subject of consuming importance, which has been treated very superficially, we should regard for a moment the varied symptomatology complained of by suffering women. The gynecologist knows only too well that diseases, de-

formities and malpositions of the female generative organs may give rise to chapters of symptoms, not the least conspicuous of which, in many instances, are nausea and vomiting. The symptoms may not point to an affection of the generative organs, but are often of a more general character, the type of which, on the one hand, is seen in neurasthenia and, on the other hand, in hysteria. Such nausea and vomiting occur always in the morning, and when alcoholism and Bright's disease are excluded from consideration, these symptoms, when occurring in the female, often indicate affections of the uterus, ovary, or appendages.

In this all too brief résumé of a most important subject, vomiting has been shown to be often a cardinal symptom of the first magnitude. I have only attempted to dispel the too frequent thought that vomiting is an unimportant symptom, and to point out the importance of using care in the interpretation of all cases of vomiting, suggesting that where the causes are not plainly indicated, an investigation should be made of every organ and bodily function, so as to determine the true cause of this important symptom.

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218 SOUTH FIFTEENTH STREET.

FIBROMA OF THE MESENTERY.

Report of a Case.

BY A. JACOBY, M. D., F. A. C. S.,

New Orleans, La.

Solid new growths of the mesentery are extremely rare, and of those seen, according to Vance, the fibromata are the most frequent. In a search of the literature up to 1906, he found that in twenty-seven cases of solid tumors of the mesentery only had operation been performed, and of these thirty-three per cent. were malignant. Abdominal surgery and the diagnosis of intraabdominal growths, however, have shown such great progress since then, that more cases have been encountered and been successfully treated by operation.

In his report, he states that in nine cases there was a mortality of twenty per cent. which would be very much too high in this present operative era. In many of these cases the growths had attained a considerable size, because the patients did not seek advice until their attention had been attracted to the growth by some accident. They had been treated for a long time for indigestion or intestinal disturbance, because of failure to receive a proper examination. In the particular case reported, the patient, who was a tailor, had his attention attracted to the abdominal growth because of pain in that region. He pressed his hands against his abdomen hoping to obtain relief, when he felt the growth. In reporting this case, I wish to call attention to a method of anastomosis of the intestines, which is not original, however, but I am not able to give credit to the one to whom it is due.

CASE.—The patient, S. P., was referred to me

by his physician on November 15, 1918. His family history was negative. Personal history: He had had gonorrhoea, otherwise had never been ill, except with indigestion and an attack of jaundice in June, 1915. These attacks of indigestion were more of the nature of gaseous intestinal disturbances. The attack of jaundice came on rather suddenly, was not accompanied by pain, and there was very little increase of temperature. The jaundice remained for twenty-one days and from that time the patient stated that he had suffered from indigestion and a marked degree of constipation. After his attention had been attracted to the abdominal mass, he saw several physicians who treated him for intestinal disturbances and considered the mass a gas tumor.

On November 16, 1918, he was admitted to the Presbyterian Hospital and after the usual preliminary laboratory examinations he was taken to the operating room on November 18th for operative treatment. Under ether anesthesia, a right rectus incision was made and the tumor mass brought out of the abdomen. It was located in the mesentery and very close to the ileum, so that its removal could be considered only by a resection of that part of the ileum in the mesentery of which it was located. After determining the amount of ileum to be resected, the fecal material was removed from the points of excision and rubber clamps applied. The mesentery was first cut away from the bowel to be excised, so that any infection along that line might be avoided. The bowel was then excised with the cautery, tied, and inverted with several rows of chromic catgut and one of silk. The ends were placed side by side like the barrels of a shot gun and a lateral anastomosis done. This method of anastomosis does away with the danger of fecal stasis in the blind ends of the gut, one of the objections to the lateral anastomosis by the ends opposite to each other. Closure of the abdominal wall was done by the usual method with silkworm gut reinforcing sutures.

The patient had a very stormy convalescence which was accompanied by a severe and persistent hiccough for several weeks. The only relief obtained was from the almost constant use of morphine sulphate, one eighth grain, and atropine sulphate, one fifteenth of a grain, by hypodermic injections. An infection of the abdominal wall developed that also delayed his convalescence. He was given a proctoclysis of glucose five per cent. and coffee equal parts, to make one pint, every six hours for nearly three days, when it was discontinued and small amounts of clear meat broth, tea, well sweetened lemonade, coffee, and fruit tablets were allowed. On November 22nd the bowels moved voluntarily, a large liquid stool resulting. From that time on the diet was increased until on November 25th he was taking a full diet. On January 15, 1919, he was discharged as cured. Two weeks later, he resumed his usual occupations and remained well until April 1st when a marked jaundice suddenly developed which became so intense that a diagnosis of malignancy was made and an exploratory laparotomy advised. It was believed that drainage of the gallbladder or the anastomosis of

the gallbladder to the duodenum might overcome the jaundice and the resulting toxemia. A laparotomy was performed on April 4, 1919, at the Hotel Dieu and after a thorough exploration, only a small contracted gallbladder was found without any obstruction of the ducts. The site of the anastomosis of the intestines was found to be very satisfactory. After his recovery from the operation, though Wassermann reactions had always been negative when made by different observers, the jaundice yielded to three injections of neosalvarsan and mercurial inunctions. He has remained well ever since, with the exception of another attack of jaundice which yielded to the salvarsan treatment. The report of the pathologist was: Fibroma with hyaline changes; tumor measured 15 cm. by 12.5 cm. by 8.75 cm., weight 132 grams; bowel length, 42.5 cm.

LONDON LETTER.

(From our own correspondent.)

*London Association of the Medical Women's Federation.—
Death of Sir Henry Burdett.*

LONDON, May 4, 1920.

A meeting of the London Association of the Medical Women's Federation was held at the rooms of the London Society of Medicine, 11, Chandos street, W., on April 20, last. Dr. Helen Boyle was in the chair. Dr. Louisa Garrett Anderson, formerly chief surgeon at the Military Hospital, Endell street, gave an account, illustrated by lantern slides, of the work at that hospital from 1915 to 1919. She said that the surgical work might be described as falling under three heads. In 1915 to 1916 large numbers of head wounds were received, and fractured skulls, with every kind of complication, were treated. In 1916 and 1917 compound fractures of the thigh were numerous, while in 1918 a series of penetrating wounds of joints, especially the knee joint, were common.

It is interesting to note that Dr. Anderson is enthusiastic as to the value of bipp, which from all accounts seems to have been the greatest antiseptic success of the war. Dr. Anderson said it was first tried in 1916. It was used afterward in a large number of cases of compound fracture, and always with the best results. It replaced other disinfectants. It aided in ward work enormously, as cases which had previously been dressed twice or thrice daily were left undisturbed with bipp for a week or more. It apparently altered the prognosis of cases and shortened the time of treatment in hospital. Over 26,000 men passed through the hospital, and 7,000 operations were performed; 300 beds were set aside for orthopedic cases. The speaker drew attention to the fact that the treatment of fractured thighs and wounds complicating joints had been revolutionized by Sir Robert Jones and his disciples, Major M. Sinclair, and Major J. Everidge. In 1914 a case of compound fracture of the femur was a source of infinite anxiety to the surgeon and great suffering to the patient, it meant dressings at frequent intervals, drainage tubes, constant operations for the removal of sequestra, and, at the end of months of misery, a weak leg,

considerably shortened, possibly with a stiff knee. The modern method of thorough preliminary investigation and cleaning, following by the application of bipp to the wound, suspension on a net bed or a Balkan frame, a wellfitting Thomas splint, and early movement of the knee, was incomparably better. The evolution of technic for dealing with penetrative wounds of joints was equally striking. In 1918 it was not uncommon to regain a full, or almost full range of joint mobility.

* * *

A great organizer, a great financier and a great personality has just passed away in the person of Sir Henry Burdett who died in London on April 29th last, at the age of seventy-three. Although educated for the medical profession, and in fact passing all his professional examinations, he never took a degree or qualification in medicine or surgery, and yet he probably did more for medicine than any man of his time. For the first six years of his working life, and it was indeed a working life, he was superintendent and secretary of the Queen's Hospital, Birmingham, and for the next six years filled a similar position at the Seaman's Hospital, London. During his six years' term of the latter post, he displayed exceptional financial ability and organizing powers. He succeeded in raising the income of that institution from £7,000 to £13,000 a year.

His chief and most lasting memorial will be his work in aid of philanthropic and social causes. He was the founder of the Royal National Pension Fund for Nurses, which proved a conspicuous success. In less than ten years, 5,000 nurses joined the fund, the endowment reached £73,000, the total investment amounted to £384,000; while the pensions policies numbered nearly six thousand, and the sickness policies, nearly two thousand. Nor was this all Sir Henry Burdett did for the immediate benefit of nurses. He was one of the first to organize a system of training nurses according to modern ideas, and in many other directions he labored to raise the status of their profession. He did almost as much for the hospitals as for the nurses and took the deepest interest in the Hospital Sunday Fund. He was always a firm believer in the voluntary hospital system and in the existing hospital crises, although enfeebled by illness, employed his pen to insist that ample funds could be raised to continue the voluntary system. He founded and was editor of the *Hospital* and he established *Science Progress* and a nursing journal. He published many volumes on the activities and organization of hospitals and on the multiform aspects of the nurse's life and work. He is best known in America and all English speaking countries by his *Hospitals and Charities*, a year book of philanthropy, which contains a stupendous amount of special information and is recognized as a leading book of reference on the many subjects discussed in its pages. Sir Henry Burdett was assuredly one of the great workers of the age and like several other distinguished men and intense workers did a large proportion of his literary labors while the world in general was sleeping.

Editorial Notes and Comments

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GENERAL GORGAS.

The death of Dr. William Crawford Gorgas marked the passing of a worker in the field of medicine whose achievements did much to show the world the importance of medicine in relation to human progress. Through his ability as an organizer he took advantage of the advances that had been made in the laboratory, the clinic, and the researches in sanitation, and applied them to the practical task of making possible the construction of the Panama Canal. He thus achieved lasting fame and did great service to humanity. The painstaking work of all the men who had furnished the material for him was not lost. The pragmatic application of their findings gave real value to their results. It took medicine into the realm of national achievement and into every avenue of commerce. His was a really great work.

He brought to public attention the power of medicine when applied on a large scale. The results of his operations involved cities and armies. He cleaned up the fever laden canal zone; he eradicated some of the deadliest diseases known to mankind; he converted the most loathsome spot on the American continent into a place of beauty and a pleasure resort. He was triumphant after the French had twice failed. He succeeded in the face of sceptical criticism, when wise men predicted failure. His was the courage of facing an apparently hopeless task. Proud should America be of having contributed such a man to the field of medicine.

His peace time achievements were constructive. For these he will not be forgotten. Many of the rules he set in the construction of the canal were carried over and used during the war.

Here too he was willing to learn and take advantage of the work done by medical men in other armies. Observers were stationed with the Allied armies in the field and their findings were brought back to the American army so that the American troops would get the benefits. In the meanwhile under his direction the organization of the units was rapidly and skillfully accomplished and when hostilities began the troops had the best care of any of the armies in Europe. All this with the disadvantage of the army being across the sea, thousands of miles away. All medicines, foods and supplies had to be transported from America to the great body of men in the American army. Much of this success was due to the close harmony between the Red Cross and the army. Gorgas made this possible. Lives were saved. While the practitioner is beloved for the work he does in daily contact with his patients, the admiration of a nation is tendered General Gorgas for the work he did for the masses and a permanent place in the annals of medicine.

Born in Mobile, Ala., in 1854, General Gorgas was educated at the University of the South and received his medical training in New York at Bellevue. In 1880 he was appointed a surgeon in the U. S. Army. It was during the Spanish war that his work first brought him general attention. He was serving as health officer of Havana when he seized upon the discovery of the transmission of yellow fever by mosquitoes, and proceeded to clean up the city. Then followed his work on the Panama Canal. In 1913 General Gorgas went to South Africa at the request of the British Government to investigate conditions in the Rand Mines, where thousands of natives were dying of pneumonia. In 1914 he was appointed Surgeon General of the United States Army. His last campaign was waged against yellow fever strongholds in Ecuador, under the auspices of the International Health Board of the Rockefeller Foundation.

ICTEROGENIC SPIROCHETOSIS.

The morbid process called Weil's disease, whose pathogenic agent was discovered by a Japanese, shows in apyretic cases a normal coagulation while in others the coagulation appears in from five to twenty minutes, but it never appears to be delayed as it is in acute red-yellow atrophy of the liver.

Usually the globular resistance is increased but there are periods when this resistance is decreased and this is probably the cause of the anemia observed from time to time in the advanced periods of the disease. On the other hand, the anemia occurring at the onset of the affection is due to a relaxed hematopoiesis. Examination of the bone marrow and splenic pulp shows that the erythrocyte is active in both structures and the manufacture of red blood corpuscles is lessened. No myeloid element can be detected in the spleen although it would appear that some megakaryocytes are present and there is an intense production of macrophagocytes. While in cases undergoing a rapid evolution the size of the spleen varies little, it is quite otherwise in the cases with a slow evolution; the latter is a sclerosis of the splenic pulp. This sclerosis is independent from the lymphatic elements and seems to be related to the multiplication of the macrophagocytes. The lymph nodes usually offer a follicular hyperplasia and a multiplication of the large mononuclears without macrophagia, but with cells containing basophile grains. The condition of the lymphatic lymph node of the hilum of the liver is different. Here necrosis and bacilli are present. It would seem as if this were consequent upon a bacterial infection of the biliary tract superadded to the infection by the spirochetes.

The liver is much larger than normal, varying between 1650 to 2350 grams, while its color varies between a yellowish dark green to that of Sienna earth. The biliary tract is not pathologically changed. The gallbladder contains little bile and may contain blood. In cases where death occurs after the second day, the tissues near the central vein are greenish while those near to the Kernian spaces are brown. The greenish tint is due to an accumulation of pigment. Microscopically, the icterogenic spirocheta produces a hyperplasia of the hepatic parenchyma with hyperbiligenia. When death takes place at the onset of the process a multiplication of the trabecular cells may be the only morbid change noted, nevertheless there is also a moderate steatosis—in acute red-yellow atrophy the steatosis is more marked—the dislocation of the cells of the lobules is very characteristic.

All these lesions are found in the acute cases, while those arising in cases having a slower evolution are as follows. There is a decrease in the size of the cells, a slight lymphocytic infiltration, a necrobiosis of certain hepatic cells, which are undergoing multiplication, slight steatosis, accumulations of pigment in the trabecular cells and dilatations of the intercellular canaliculæ. At the onset of the disease the spirochetes are numerous in

the liver and this is in relation to the appearance of the icterus. The kidneys are usually involved, the weight of each organ varying between 180 to 325 grams. There is an interstitial reaction tending to sclerosis and epithelial degeneration. The glomerulæ remain intact, while the tubuli contorti are invariably involved. In subjects dying from aneuria a singular fact is that the tubuli contorti are free from bile pigment, therefore indicating that there is a renal inhibition and in these cases the hepatic lesions are profound. The lesions of the tubuli contorti are certainly due in part to the spirochetes which are eliminated by the tubuli and indirectly to the lesions of the hepatic cells.

CANCER OF THE MIDDLE EAR.

The positive diagnosis of malignant disease of the middle ear and the external auditory canal in its bony portion may be difficult at the onset of the process, and microscopical examination at this time is the only means at our disposal of ascertaining the true nature of the granulations. Later, pain, facial paralysis, and rapid cachexia will lead to a suspicion of malignancy and a biopsy should be made. It is quite possible that radiography will render assistance when a more perfect technic has been devised, as it is hoped that by this means will be revealed the process taking place in the bony walls of the external ear as well as in advanced neoplasia where there are few or indefinite symptoms.

The various hearing tests will show the state of the auditory apparatus. The tests for nystagmus, in particular, will give useful data as to the state of the vestibular labyrinth, from which, in cases of vertigo, one will be able to ascertain how much this depends upon the state of the middle ear and how much it may depend upon central compression only. Caloric and rotatory nystagmus must likewise be searched for, although the pathogenesis of these symptoms is still a moot question. It may be simply stated that if nystagmus produced by the injection of cold water into the diseased ear does not give rise to rotatory nystagmus on the opposite side, it should not be hastily concluded that a destructive process is going on in the labyrinth. In point of fact, the neoplastic masses interposed may form a kind of cushion against the thermic action and thus warp the result. Consequently, in these cases nystagmus must also be provoked by gyration. If then there is no nystagmus reaction it will be perfectly logical to conclude that there is destruction of the vestibule. The search for voltaic nystagmus must not be overlooked and in this test Babinski's method should be followed.

The only differential diagnosis to make is that between granulations of the cavity of the tympanum, polypi, and cholesteatoma, but the latter is less rapid in evolution and does not bring out the early cachexia as is the case in malignant disease. Microscopically, in cholesteatoma the cells are of the pavement type, since the process is formed by desquamation of the epidermis and never will horny globes be found which are characteristic of epithelioma. The question of primary cholesteatoma would not be discussed as it is still a debatable subject, some observers maintaining that it is a true neoplasia.

PSYCHOLOGY AND INTERNATIONALISM.

The American National Research Council, based upon forty or more scientific societies to promote the interests of pure and applied science, numbers among them the division of psychology and anthropology, which division has formulated a number of cooperative projects. Here are two: The examination of four alien groups, Mexicans, Scandinavians, Sicilians and Japanese; some two thousand to be scientifically examined so as to shed light on the problem of assimilation in the United States.

The second plan is to send an expedition to Central Africa in the Congo upper regions to study the aborigines untouched by civilization. A language-learned psychologist will head the expedition. If the aborigines could visit Europe at present they might insist on the incoming scientists being examined for freedom from the germs of that exhausting disease—civilization.

SANITATION AND GOOD WORK.

Nothing annoys a patient who has made an auto-diagnosis of heart disease, brain fag or lung trouble, to be told that the whole source of mischief lies in constipation or his kidneys. It is the same with many social industrial reformers. They study fatigue and efficiency, mind measuring, better hours, better homes, but, if told that toilet rooms, revolting in appearance and difficult of access, were often accountable for faulty work and discontent, they would not believe. But, for the Safety Institute of America no study is insignificant, and they consider a decent sanitary equipment as a valuable asset to any work place. Employees reluctantly yield to Nature's demands when the toilet is uncleanly, and it is hard for them, when, at the end of the day, they have to go unwashed among the people in crowded cars and ferries.

Toilet rooms should be placed where they are exposed to light and air. Sunlight is a powerful germicide and disinfectant. If artificial light has to be used it should penetrate to every corner so showing up dirt and inducing thorough cleanliness by flushing or scrubbing the floor. It should be easily accessible, yet not too prominent, because some false modesty still exists, many girls saying

they would rather die than walk to an obvious toilet through a room crowded with men. These do die generally of architectural blunders, though relations term it stomach trouble, and vendors of patent medicines grow rich from the sale of headache powders and liver tonics, the necessity for which is not in hard work but wretched sanitary equipment.

News Items.

Cambridge University Faculty.—Professor James Thomas Wilson has been elected professor of anatomy in Cambridge University to succeed the late Professor Macalister.

Diplomas in Psychological Medicine.—The University of London is about to institute a diploma in psychological medicine, the standard for the diploma being about that required by the University of Cambridge.

Medical Journalism.—Professor Giuseppe Guicciardi of Reggio Emilia has succeeded the late Professor Augusto Tamburini as editor of the well known journal of psychiatry, *Rivista Sperimentale de Freniatria*.

Royal College of Surgeons in Ireland.—Mr. Edward H. Taylor, regius professor of surgery in Trinity College, has been elected president and Sir W. I. de C. Wheeler has been elected vice-president of the Royal College of Surgeons in Ireland.

Award to Dr. Theobald Smith.—The M. Douglas Flattery Medal and prize of \$500 have been awarded by the Harvard Corporation to Dr. Theobald Smith, formerly of Harvard University, in recognition of successful scientific research resulting in the prevention of disease and the conservation of health.

Correction.—The statement was made in a recent issue that the proposed International Health Office to be established under the health section of the League of Nations would be located in London. The International Health Office is, however, to be established at the seat of the capital of the League of Nations.

North Carolina Medical Meeting.—The Medical Society of the State of North Carolina recently held its annual meeting, under the presidency of Dr. Carl V. Reynolds, of Asheville, and elected the following officers: President, Dr. Thomas E. Anderson, Statesville; vice-presidents, Dr. Charles S. Lawrence, Winston-Salem; Dr. William H. Ward, Plymouth; Dr. John M. Manning, Durham; secretary-treasurer, Dr. Benjamin K. Hays, Oxford (re-elected).

Venereal Diseases Conference.—A Pan-American conference on the control of venereal diseases will be held in Washington, probably in December under the auspices of the American Red Cross, the United States Public Health Service, the United States Interdepartmental Social Hygiene Board, and the American Social Hygiene Association. The work of the conference will deal with three different groups of problems in the control of venereal diseases, namely, the purely scientific, the administrative, and those which have particular public interest.

Massachusetts Medical Meeting.—The one hundred and thirty-ninth annual meeting of the Massachusetts Medical Society was held on June 8th and 9th in Boston, under the presidency of Dr. Alfred Worcester. The officers for the preceding year were reelected, with Dr. Frederick E. Jones as the vice-president.

West Virginia State Medical Conference.—The West Virginia State Medical Association held its annual meeting in May, when the following officers were elected: President, Dr. J. Howard Anderson, of Marytown; vice-presidents, Dr. Hubert E. Gaynor of Parkersburg; Dr. S. G. Moore, of Elkins; Dr. Charles O'Grady, of Elkins; secretary, Dr. Robert A. Ashworth, of Moundsville; treasurer, Dr. H. G. Nicholson, of Charleston.

Parkin Prize Offered.—The Royal College of Physicians of Edinburgh announces a competition for the Parkin prize of 100 pounds, which will be awarded for the best essay on the curative effects of carbonic acid gas or other forms of carbon in cholera, for different forms of fever and other diseases. The prize is open to competitors of all nations. Essays must be in the hands of Dr. J. S. Fowler, the secretary, not later than December 31, 1920.

Eugenics Research Conference.—The eighth annual meeting of the Eugenics Research Association was held June 25th at Cold Spring Harbor, Long Island, under the presidency of Dr. Stewart Paton, of Princeton. Dr. Irving Fisher was elected president for the ensuing year, and plans were made for the transformation of the *Eugenical News*, an eight page monthly, into a quarterly *Journal of Eugenics*, under the auspices of the association.

Greek Hygienic Congress.—The first Pan-Hellenic Congress of Hygiene and Demography will be held at Athens from April 25 to 30, 1921, under the presidency of Professor Phocas. There will be sections in public health, individual hygiene, military and naval hygiene, demography, infant hygiene, and prophylactic hygiene. An international exhibition of hygiene and medical industry will be opened at the same time as the congress and will continue until June 25th.

Honorary Degrees for Medical Men.—In connection with the annual meeting of the British Medical Association in Cambridge, the council of the University Senate has proposed for the degree of LL. D. *honoris causa* the following distinguished members of the medical profession: Dr. Harvey Cushing, professor of surgery, Harvard University; Dr. Simon Flexner, director of laboratories, Rockefeller Institute for Medical Research; the late Major General William C. Gorgas, former president of the American Medical Association and Surgeon General of the U. S. Army; Sir T. Clifford Allbutt, K. C. B., regius professor of physics; Dr. Jules Bordet, president of the Faculty of Medicine and director of the Pasteur Institute, Brussels; Dr. A. Calmette, director of the Pasteur Institute, Lille; Dr. P. Giacosa, professor of materia medica and experimental pharmacology, University of Turin; Sir G. H. Makins, G. C. M. G., president of the Royal College of Surgeons of England; Sir Patrick Manson, G. C. M. G.; Sir Norman Moore, president of the Royal College of Physicians of London.

Association of American Physicians.—At the annual meeting of the Association of American Physicians, held in Atlantic City, the following officers were elected: President, Dr. William S. Thayer, of Baltimore; vice-president, Dr. Herbert C. Moffitt, of San Francisco; secretary, Dr. Thomas McCrae, of Philadelphia; recorder, Dr. Thomas R. Boggs, of Baltimore; treasurer, Dr. Joseph A. Capps, of Chicago.

Smallpox in Virginia.—During the first four months of 1920 there were 1,821 cases of smallpox reported in the State, with six deaths, compared with 770 reported cases in the same period of 1919 and ten deaths for the entire year of 1919. During 1917 the disease caused but two deaths, while in 1918 six deaths were attributed to it. In January, 1919, there were 129 cases against 467 in January, 1920. In February, 1920, the disease reached its apex for the season with 703 cases against 113 for the corresponding month of last year. In March the figures were 326 against 261 for March, 1919, while in April they were 325 and 267 cases, respectively. During April of this year smallpox was reported in thirty-four of the ten counties and during the year it has appeared in approximately half of the counties of the State.

Flechsigs' Jubilee.—Dr. Paul Flechsig, the noted Leipzig anatomist and psychiatrist, celebrated the fiftieth anniversary of his graduation on May 23rd. When assistant at the University Physiological Institute his first considerable work on Conduction Paths in the Brain and Spinal Cord attracted attention. In 1882 he took over the Neurological Clinic, built and furnished on plans drawn up by himself, whose chief he still is. Flechsig holds an honorary doctorate in the Faculty of Exact Sciences at Oxford and is an honorary member of learned societies in Dorpat, Dresden, Florence, Kieff, London, Munich, Paris, Petrograd, Rome and Vienna. On the day of his jubilee the firm of Georg Thieme, of Leipzig, issued as a Festschrift the first volume of a monumental work on the Anatomy of the Human Brain and Spinal Cord on a Myelogenetic Basis, on which the veteran psychiatrist has been intensively engaged for ten years.

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DIED.

BLADES.—In Hornell, N. Y., on Monday, June 28th, Dr. John Wesley Blades, aged sixty-five years.

DAVENPORT.—In Vancouver, B. C., on Monday, May 31st, Dr. George Edwin Davenport, aged fifty-seven years.

FRITCHEY.—In Harrisburg, Pa., on Thursday, June 24th, Dr. Charles Albert Fritchey, aged forty-five years.

GORGAS.—In London, England, on Sunday, July 4th, Major General William C. Gorgas, U. S. Army, aged sixty-six years.

MILNOR.—In Warrensville, Pa., on Thursday, June 24th, Dr. Robert H. Milnor, aged fifty-two years.

PRICE.—In San Francisco, Cal., on Saturday, June 19th, Dr. Thomas Linton Price, aged fifty-four years.

SCHUMANN.—In Oakland, Cal., on Saturday, June 19th, Dr. H. Schumann.

STRAUGHN.—In Jersey City, N. J., Dr. Frederick Straughn, aged seventy-five years.

TOMES.—In Brooklyn, N. Y., on Monday, June 28th, Dr. William Austin Tomes, aged fifty-five years.

Book Reviews

ORGANIC CHEMISTRY.

The Preparation of Organic Compounds. By E. DE BARRY BARNETT, B. Sc. (Lond.), A. I. C. With Fifty-four Illustrations. Second Edition. Philadelphia: P. Blakiston's Sons & Co., 1920. Pp. vi-273.

In this, the second edition of *The Preparation of Organic Compounds*, the author has made no fundamental change in the size or scope of his book. Several additions have been made, however, which increase its usefulness. The inclusion of a short description of larger sized apparatus suitable for use in the laboratory resulted from the author's experience during the war, when he found that few chemists had any idea of what apparatus to use when it became necessary to handle materials in unusually large quantities. Some of the apparatus described may be regarded as crude, but the average manufacturing plant is seldom fitted with the latest refinements and the practical chemist must adapt himself to his environment. Chemical preparations can be carried out in saucepans and jam pots quite as successfully as in the more conventional and more expensive beakers and basins. The description of the chemical processes is less full than in most books on organic preparations but the details given are sufficient to enable the student to carry out the preparation successfully, without being so exhaustive as to reduce the work to mere mechanical routine. The bibliography will appeal to the more serious minded student. The selection of a considerable number of preparations from the patent medicine literature, with the hope of familiarizing the student with this neglected branch of the literature, is to be commended. To the beginner and to the advanced student in organic chemistry the present volume will serve as a valuable laboratory manual and as a companion volume to the usual theoretical textbooks.

THE PSYCHOLOGY OF THE DOCTOR.

Das autistisch undisziplinierte Denken in der Medizin und seine Überwindung. By E. BLEULER. Berlin: Julius Springer, 1919. Pp. iv-207.

Some time ago Bleuler treated of autistic thinking as the type of thinking of the egoistic psychoneurotic or psychotic. Now he comes forward to apply the term to the prevailing mental attitude in medical conception, treatment, prophylaxis, considerations of etiology, pathology and all that pertains to medical practice. He uses the term because he believes that medical thinking lags sadly behind in the precision, accuracy and persistent search after facts and facts only on which to base all activities and attitudes which should mark a profession so important and presumably scientific. He looks upon the physician as caught unconsciously in the desire to serve the patient's immediate need, to conform to the patient's wish and therefore pressed upon by the force of his own desire to maintain himself as physician and arise at once to the demand put upon him. Thus more and more he has become enmeshed in elaborated and meaningless formulistic prescriptions of various sorts, in interference with Nature's processes, a godlike assumption even of her activity, which

have blinded him to simplicity and actuality of facts as the governing factors of practice and theory.

Bleuler makes a plea for a humbler and more truly scientific position on the part of the profession, whether in the physical or psychic world, whether in the realm of pharmacology or in prescription of whatever sort, in understanding the reaction of individuals to any part of the environmental world. The physician has failed in this in physical diseases as in the mental. The quack has often superseded him because he has had naturally a better intuitive appreciation of the far-reaching psychology of interrelation and the part that a variety of facts play in the lives and health of men. The physician is a victim of a psychophobia which keeps him from a clearer investigation of actualities which are both psychological and otherwise scientific. The existing state of things is difficult of remedy, but Bleuler asks that a new type of disciplined thinking, investigative and constructive, shall become the rule. He points out the part the medical school and medical publications have in promoting this end.

SMALLPOX AND VACCINATION.

Half a Century of Smallpox and Vaccination. Milroy Lectures Before the Royal College of Physicians, 1919. By JOHN C. MCVAIL, M. D., LL. D., Edinburgh: E. S. Livingstone, 1920. Pp. iii-86.

A book from a Scotsman generally merits attention when it concerns a big subject. It may be dry or too erudite, but is reliable, so one settles down with easy mind to study smallpox as it was and is, vaccination as it was and is, and the control of smallpox in the present day.

The second lecture rebuts a contention that infantile vaccination, which protects the individual, makes smallpox "so difficult to recognize where it is not wholly prevented that the result is such spread of infection from missed cases disadvantageous to the community."

Careful statistics show smallpox to have increased gradually in power in the eighteenth century; to have reached its maximum in 1870-73, and since then to have "retrogressed in fatality, infectivity, and prevalence." He wisely remarks that it is too soon after the war to prophesy that we have seen its last consequences with regard to epidemic disease, but, whether it be of the American type with low infectivity or the severe type of the seventies, the means for meeting it are at hand.

THE MENDELIAN THEORY.

Mendelism. By REGINALD CRUNDALL PUNNETT, F. R. S. Fifth Edition. London: Macmillan Co., Limited. 1919.

A straightforward presentation of the Mendelian theory. In this, the fifth edition, are set forth the results of the work done on *Drosophila*, the fruit fly, by Professor Morgan, of Columbia University. These researches of Morgan's have done much to shed new light on the problem of heredity and many are of the opinion that it is one of the most far-reaching scientific discoveries of late years. The working out of hereditary traits up through man should have a direct practical bearing in the field of

medicine. On account of the great diversity in humans it is at times difficult to trace this. However, new work which has been done recently in the transmission of endocrine characteristics has opened a new field in the study of heredity and medicine. In order to realize the full significance of the work done by this painstaking monk on the common pea it is necessary to review the work as he actually did it. The extent of its influence, it should be recalled, is not limited to man and, as the author has pointed out, Mendel's findings have an economic value when applied to agriculture and the breeding of animals for live stock or other purposes.

This exposition presents the problem simply, tracing each step with care and leaving a cohesive picture of the problem of heredity as we understand it today.

HANDBOOK OF MEDICINE.

Wheeler's Handbook of Medicine. By WILLIAM R. JACK, B.Sc., M.D., F.R.E.P.S.G., Physician to the Glasgow Royal Infirmary, Lecturer in Clinical Medicine in the University, Glasgow. Illustrated. Sixth Edition. Edinburgh: E. & S. Livingstone; New York: William Wood & Co., 1920. Pp. v-561.

Since the first edition of *Wheeler's Handbook of Medicine* it has been found on the bookshelves of many physicians. This small compend has been more widely read as a ready reference work than many of the more unwieldy volumes. It is a convenient book both in size, composition, and brevity. Unfortunately, the present edition, the sixth, is badly printed. This is a drawback for a book of this type. While it may seem an unimportant point to criticize, and while allowances must be made for difficulties in regard to labor conditions and the scarcity of paper, it seems as though an unwise saving has been attempted. There are a few additions to the book due to a discussion of some of the diseases more commonly found during the war, but on the whole the general style and contents have remained unaltered.

MODERN PROGRESS.

The Story of Modern Progress. With a Preliminary Survey of Earlier Progress. By WILLIS MASON WEST. New York: Allyn & Bacon, 1920. Pp. xvi-701.

Fifty years ago an English schoolboy began his history composition by saying: "When Julius Cæsar landed in Britain all the world was in heathen darkness." It was—for the schoolboy. Term after term he plodded through his history of England. After that came the history of Rome, followed by that of Greece. There were no small histories of European countries, so that when he began the large ones, he never linked up dates nor made any connections, so he hazily imagined that other countries became civilized and started off as histories some time after his own, and he wearily took up Germany or said, thankfully, he had done France. The writers of schoolbooks made them as dry as possible, so that an anecdote was hailed with relief, and these retained in the mind, formed the basis of world knowledge.

It was a great task for the author to gather contemporary actors on the world's stage, not making its tragedies and comedies separately but all acting and reacting on each other as nations. Teachers will welcome its teaching, the schoolboy

will unconsciously benefit, and all use it as a useful reference. Naturally, one man cannot always judge rightly concerning the affairs of many nations in quite modern dealings because the babble of modern historians has not yet quieted down for the voice of Truth to be heard, but the reader feels that Professor West keeps an intent ear for her decisions, and so they walk together in glad trust through the Stone Age right away to the present century.

THE DEATH OF TITIAN.

The Death of Titian. By HUGO VON HOFMANNSTHAL. A Dramatic Fragment Enacted at Munich in Memory of Arnold Böcklin. Translated from the German by JOHN HEAD, JR. Boston: The Four Seas Company, 1920. Pp. ix-27.

It is the function of the masters in art and literature to present new and recreative views of life. They awaken us afresh to a fuller comprehension of its wealth and beauty as well as its darker meanings. This fragment reminds us of the depth and richness discovered by the great painter and portrayed permanently for the world's appreciation in his canvases. The poet dramatist who had dedicated to him this memorial has added to all this a quickening perception and lesson of his own.

The melody of the lines, which the translator has well reproduced, flows deep and full with the unbroken abundance and softness of a Venetian night in the master's own garden. Even the stage setting for the piece is indicative of the warmth of beauty in which the lines, in the mouths of the master's pupils, express more fully the field where Titian found his inspiration and expression. The poet has made to live again the vitality of the mind which could comprehend the sensuously beautiful in life in such vivid terms, to whom these things were the clothing of a spirit which breathed through them, renewed its courage and expanded its power in artistic mastery of them. The artist's more penetrating eye and warmer heart seizes and recreates this warmth and beauty for us.

More poignant still is a message from the dramatist's own conception. A high sustained note throughout this dramatic fragment gives a consummating force to the mere description of the painter's conception and expression. It lifts the reader's thought continually above the mere beauty, rich as that is, and above the sorrow of the pupils and members of the household. This is the reiterated contrast suggested rather than spoken between Gianano, young and handsome, in love with life and afraid of death, and the aged master. Gianano's fear is stronger than grief, the natural egotistical fear of one who has not yet found life and tried his powers. It arises when death suggests the uncertainty of all this. "Death! Death! . . . I've never stood so close to Death before!" Titian on the other hand has revived for work the best that he has yet done. "A radiance as a saint's shines through his pallor, as he paints and paints," eager only to secure these few more moments of creative activity. It is only outside that they mourn; the master is quiet and busy within. The sadness of death comes to those at the other side of life, where its achievements exist only in prospect and in uncertainty. The creator who has exhibited mas-

tery of his powers and of the world surrounding him is calm and even gay. His work is not torn from him, it only claims him up to the last moment when smilingly the brush is laid aside.

WILLIAM J. LOCKE.

The House of Baltazar. By WILLIAM J. LOCKE, Author of *The Rough Road, The Red Planet*, etc. New York: John Lane Company, 1920. Pp. ix-312.

It is curious how men depicting things by pen or brush or pencil always put in one little point of incompleteness to make it look more natural, more true to life. On a library shelf one book is askew or with a torn binding; in drapery, one fold hangs askew. In a shop whose window showed marvels in artificial flowers, I noted one group with a faded blossom, some petals fallen from another lay on the floor. Some such deliberate indication of imperfection is given in John Baltazar in his forcing himself to do what he has purposed without looking all round the question, but after a little acquaintance you feel that the human weakness only shows up the sturdy, dogged, cheerfulness he abundantly possesses. The author plays on the feelings of his readers in the same way as the skilled acrobat on the sightseers, who, when in a position of extreme danger nearly loses his balance, but does it intentionally to enhance the situation.

John Baltazar, mathematical professor at Cambridge, nearly leaves a waspish wife, who has not told him of her approaching motherhood, to go away with a bonnie pupil but flees to China instead, disappears, in fact, for nearly twenty years, and returning sets up as a hermit in a lonely cottage with his priceless Chinese manuscripts to write a marvelous book and continue mathematical studies. No news of the outside world comes to him, his faithful Chinese servant pupil is bound over to discreet silence, and only a Zeppelin bomb, destroying the cottage when the war has already been waging two years, brings him to a realization of the war, and knowledge of the fact of his possessing a motherless son, already war wounded, from the girl pupil—now over thirty—who is a hospital nurse and recognizes the son's name among her charges.

The erudite labor of many years was all destroyed by the bomb, but the countershock of his country's peril arouses him to devote himself wholly to her, a golden thread of love in the way of a determination to tenderly coax the nurse, Marcelle, to marry him, his consolation. Tremendous success attends his politicomilitary efforts. He is one of the coming men; his dream of helping is realized. But his new found soldier son becomes entangled with the beautiful wife of a politician. She is bent on being a leader, and delights in political secrets. She has induced the son to elope with her; his military career will be ruined. They are on the railway platform; the train is leaving in a few minutes but toward them is hastening John Baltazar, just in time to hurry his son off the scene and face the husband of Lady Edna Donnithorpe, whom he forces to believe that he—John—is the intending eloper. The snarling, scandal loving politician does not really believe, but is greatly glad to ruin his enemy, so there stands the hero facing the third crisis in his life. Sweet love refused for the honor

of a girl; the fruits of long study rudely destroyed, a dream of helping his country vanishing, all his promises fulfilled, no reward to the promiser save seeming defeat. He will return to China—alone. Then, at 2:30 a. m., a most dismal hour to be housed with disappointment as a companion, comes Nurse Marcelle to give him what he has so patiently waited for and scarcely hoped to win. She will go with him, and life shall reblossom in the land of his exile.

In one part of the book he deprecates his name of John, equally so its diminutive Jack of melodramatic fame, but, from much reading, the reviewer guessed a John could not go wrong, for all heroes called in fiction are invariably strong, and indomitable right away to the end of life and the book.

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

THE FOOLISH LOVERS. By ST. JOHN G. ERVINE, Author of *Changing Winds, John Ferguson*. New York: The Macmillan Company, 1920. Pp. iii-403.

DIE KINDERTUBERKULOSE IHRE ERKENNUNG UND BEHANDLUNG. Ein Taschenbuch für praktische Ärzte von Prof. HANS MUCH. Leipzig: Verlag von Curt Kabitzsch, 1920. Pp. v-35.

MASKS. *With Jim's Beast, Tides, Among the Lions, The Reason, The House.* One Act Plays of Contemporary Life. By GEORGE MIDDLETON. New York: Henry Holt & Co., 1920. Pp. 3-227.

O. HENRY MEMORIAL AWARD PRIZE STORIES, 1919. Chosen by the Society of Arts and Sciences. With an Introduction by BLANCHE COLTON WILLIAMS. Garden City and New York: Doubleday, Page & Co., 1920. Pp. xvii-298.

THE MICROBIOLOGY AND MICROANALYSIS OF FOODS. By ALBERT SCHNEIDER, M. D., Ph. D. (Columbia University); Professor of Pharmacognosy, College of Pharmacy, University of Nebraska, etc. Illustrated. Philadelphia: P. Blakiston's Son & Co. Pp. v-262.

EREWON REVISITED TWENTY YEARS LATER. Both by the Original Discoverer of the Country and by His Son. By SAMUEL BUTLER, Author of *Erewhon, The Way of All Flesh, Life and Habit*, etc. With an Introduction by MOREBY ACKLON. Illustrated. New York: E. P. Dutton & Co. Pp. xxvii-304.

LES ALLURES CLINIQUES DE LA SYPHILIS ET LES FORMES DE PARALYSIE GÉNÉRALE CONSECUTIVE. Par Dr. LUIGI ROMOLO SANGUINETTI, de la Faculté de Médecine de Paris; de la Faculté de Médecine de Sienne (Italie); ex-interne de l'Asile d'Alienes et de l'Institut de Pathologie Générale. Paris: Jouve & Cie, 1917. Pp. i-287.

ESSENTIALS OF PHARMACY, WITH QUESTIONS AND ANSWERS. By CLYDE M. SNOW, Ph. G., A. M., Associate Professor of Pharmacy, University of Illinois School of Pharmacy; Graduate Instructor in Pharmacology. University of Illinois College of Medicine, etc. St. Louis: C. V. Mosby Company, 1919. Pp. xiv-734.

LEHRBUCH DER SPEZIFISCHEN DIAGNOSTIK UND THERAPIE DER TUBERKULOSE. Für Ärzte und Studierende von Dr. BANDELIER, Chefarzt des Sanatoriums Schwarzwaldheim in Schomberg bei Wildbad, und Prof. Dr. ROEPKE, Chefarzt der Heilstätte Melsungen, Facharzt für Lungen und Halskrankheiten in Kassel. Mit einem Vorwort von Winkl. Geh. Rat Prof. Dr. R. KOCH, Exzellenz. Zehnte Auflage. Mit 25 Temperaturkurven auf 7 lithographischen Tafeln, 2 farb. lith. Tafeln, und 6 Textabbildungen. Leipzig and Würzburg: Verlag von Curt Kabitzsch, 1920. Pp. xi-501.

Practical Therapeutics and Preventive Medicine

A Compendium of Treatment and Prophylaxis, Original and Adapted

Nutrition and Public Health with Special Reference to Vitamines.—J. F. McClendon (*American Journal of the Medical Sciences*, April, 1920) believes that the nutrition of some individuals, especially infants, is not ideal, and that the high cost of living is leading to worse nutrition. A large part of the population has unconsciously depended on the presence of milk in an otherwise inadequate diet, and the decrease in milk consumption that is now taking place is to be viewed with alarm. The supply of fresh green vegetables is not sufficient to be a substitute for milk. Grass is not adapted to human alimentation except in the form of sprouted grass seeds. In the sprouting of seeds vitamines are synthesized in the young leaves and a quick crop of vitamines may be obtained without the necessity of planting the seeds in the ground. Wheat or rye, sprouted until the shoot extends an inch beyond the grain and heated in water to 70° to gelatinize the starch, forms a cheap, convenient, and palatable source of vitamines. The seeds may be freed from bacteria before sprouting. Since beef fat is about as valuable a source of vitamines as is butter, beef drippings and fat should be eaten rather than thrown away, and the same applies to some other animal fats. Prolonged cooking of fresh foods should be discouraged, but all canned goods should be heated to boiling before they are served, to destroy toxins of bacillus botulinus that might be present, unless a competent inspection of the goods has been made.

The Sippy Treatment of Peptic Ulcer.—Julius Friedenwald and Theodore H. Morrison (*Southern Medical Journal*, May, 1920) state that this treatment has yielded most gratifying results in a large number of cases. Sippy's treatment consists in protecting the ulcer from the acid corrosion of the gastric juice until it has healed. This is accomplished by maintaining a neutralization of the free hydrochloric acid from early in the morning until late at night. The neutralization is effected by frequent feedings and the administration of alkalies, given freely and at frequent intervals. Nourishment is given from the start. The patient remains in bed for three or four weeks. Three ounces of a mixture of equal parts of milk and cream are given every hour from seven a. m. to seven p. m. After two or three days soft eggs and well cooked cereals are gradually added until in ten days the patient receives three ounces of milk and cream mixture every hour, three or four boiled eggs, and nine to twelve ounces of a cereal each day. Cream soups of various kinds, vegetable purees, and other soft foods may be substituted now and then as desired. One egg is given at a time and three ounces of a cereal at a single feeding, the cereal being measured after it has been prepared. The cereal and eggs are given alternately and taken at the same time as the three ounce mixture of milk and cream. The total bulk of each feeding should not be over

six ounces. After a longer or shorter period, according to the condition of the patient, a large variety of soft and palatable foods may be used, such as jellies, marmalade, custards, and cream, but the basis of the diet should be milk and cream, eggs, cereals, vegetable purees, and bread and butter. Alkalies are administered from the beginning of the treatment, between the feedings, to neutralize the acid secretion; powders of heavy calcined magnesia, ten grains, with sodium bicarbonate, ten grains, being alternated with powders of bismuth subcarbonate, ten grains, and sodium bicarbonate, thirty grains. It is also advisable to give the powders every half hour after the last night feeding for a number of doses. If the acidity is not promptly controlled ten grains of sodium bicarbonate may be added to each powder until it is controlled.

The aftertreatment of these patients is important. The hourly feedings and alkaline powders must be continued even after the patient is pursuing his regular occupation. If this is impossible, he may be allowed a light breakfast of from ten to twelve ounces of cereal, eggs, bread and butter, or any soft food. A thermos bottle containing equal parts of cream and milk can be utilized for supplying the hourly feedings. Three or four ounces can be taken hourly until noon, when a light luncheon may be eaten, consisting of easily digestible meats. During the afternoon three or four ounces of milk and cream should be taken hourly until the evening meal. The total bulk of food should not be sufficient to cause a greater increase in weight than is desired. If hourly feedings cannot be maintained, the three usual meals should be substituted and the powders taken every hour for three doses after a light breakfast; one hour after luncheon a powder should be taken, two powders at the end of the second and third hours, and one at the end of the fourth. After ten to twelve weeks the feedings may be increased to two hour intervals and the powders continued midway between the feedings.

About twice the amount of food should be taken at each feeding, and two powders midway between the feedings. At the end of twenty or more weeks the patient may partake of three meals daily and may be allowed a glass of equal parts milk and cream midway between breakfast and luncheon, and between luncheon and dinner; two powders should be given between breakfast and the milk and cream, two between the milk and cream and luncheon. Powders should be taken similarly in the afternoon, and finally two powders three hours after the evening meal. The writers assert that this treatment has given them ninety-four per cent. of cures in the mild cases; eighty-five per cent. in the moderately severe; eighty per cent. in the severe cases, an average of eighty-six per cent. of cures in all cases and the results were better than those obtained by other forms of treatment.

Treatment of Hyperchlorhydria in Children.—James Hoyt Kerley (*Medical Record*, May 8, 1920) describes this condition in children as accompanied by a feeling of fullness in the epigastric region, with indefinite pains radiating from the region of the umbilicus; there are also often eructations of acid gas and heartburn. A powder of magnesium carbonate, one grain, sodium bicarbonate, two grains, and bismuth subcarbonate, two grains, may be given fifteen minutes before each meal. For the constipation rhubarb and soda mixture, combined with aromatic cascara sagrada, may be given in one or two dram doses at bedtime. The diet should be carefully regulated. Orange juice, if allowed, must be taken only after the morning meal; the white of egg only is to be eaten, as the yolk excites acid secretion. Highly seasoned soups should be forbidden, and red meat taken only once a week. All excessive sugar, candy, sodas, ice cream, and pastry are to be avoided, and tea, coffee, and ice water are harmful. Raw fruit is not permitted until the appetite has become normal. A diet of farinaceous foods with milk, potatoes, green vegetables, stewed fruits, with wheat bread, toast or zwieback is to be followed. A proper amount of rest is to be insisted upon, with a change of scene in the worst cases. This condition is a common cause of defective appetite in children.

Early Lesions in the Gallbladder.—William Carpenter MacCarty and J. R. Corkery (*American Journal of the Medical Sciences*, May, 1920) state that the early changes in the gallbladder consist of: 1. Congestion and edema of the villi frequently associated with a bulbous appearance which makes them look cystic; occasionally they are cystic. 2. Local or general slight degree of lymphocytic infiltration, which manifests itself only in a slight enlargement of the villi and a cloudy or duller appearance. 3. Local or general slight degree of lymphocytic infiltration in the mucosa alone, which may be normal, but when seen in association with a similar infiltration in the submucosa, muscularis, and subserosa, probably indicates a pathological condition. 4. The presence of fibrosis in the villi, which usually are not thin and tentacular in sections like those of the perfectly normal organ. The fibrosis sometimes extends into the submucosa, muscularis, and subserosa. 5. The presence of lymphocytic infiltration and fibrosis plus the presence of a finely granular or lipid substance in the epithelium, or just below the epithelium in the mucosa. 6. The presence of slight or no lymphocytic infiltration and fibrosis plus the presence of large spheroidal cells filled with finely granular lipid substance in the mucosa and sometimes in the submucosa. These cells are similar to those which have been described in the so-called strawberry gallbladder, and in papillomas. This substance may not be visible grossly, but may sometimes be detected with the high power dissecting microscope. It is the substance which gives villi in the strawberry gallbladder and papillomas their yellow or white appearance. The conditions described do not alter the gross exterior of the organ, and do not greatly alter the internal appearance to the naked eye. Therefore a careful microscopic examination is required.

Intestinal Complications of Measles.—Giulio Funaioli (*Gazzetta degli Ospedali e delle Cliniche*, December 7, 1919) thinks that these are much more frequent than is ordinarily supposed. He believes that they may be divided into three classes: 1, prodromal; 2, concomitant or primary, and 3, secondary. The primary are due to intestinal enanthemata, while the secondary are due to the normal inhabitants of the bowel. The prodromal are usually due to a preexistent enteritis, as at this time the measles virus could not produce any noteworthy intestinal lesions.

The Effect of Pyloric Obstruction in Relation to Gastric Tetany.—W. G. MacCallum, Joseph Lintz, H. N. Vermilye, T. H. Leggett and E. Boas (*Bulletin of Johns Hopkins Hospital*, January, 1920) produced pyloric obstruction in dogs and found that when the acid gastric juice was all removed and no chlorides were given in the food, spontaneous twitching and usually violent convulsions developed. A constant rapid diminution in the plasma chlorides with a corresponding rise in the alkali reserve was noted, together with a heightened electrical excitability. It was possible to prevent these symptoms by giving the animal a large supply of chlorides following the operation. After the onset of the symptoms the administration of chlorides had a beneficial effect.

Carcinoma of the Duodenum.—According to J. B. Deaver and I. S. Ravdin (*American Journal of the Medical Sciences*, April, 1920) carcinoma of the duodenum is a rare condition found in 0.033 per cent. of hospital autopsies. The percentage of carcinomas of the entire intestinal tract originating in the small intestine varies from 2.5 per cent. to 3.1 per cent. The relative proportion between carcinoma of the duodenum to that of the jejunum and ileum is 47.7 to 52.2 per cent. Inch for inch the duodenum is much more likely to undergo carcinomatous change than the jejunum or ileum. The relative frequency at various sites of duodenal carcinoma is: First portion, 22.15 per cent.; second portion, 65.82 per cent.; third portion, 12.02 per cent. Carcinomatous degeneration of chronic duodenal ulcers is not so frequent as in chronic ulcers.

Dietotherapy in Diseases of the Pelvic Bowel.—Charles J. Drucek (*Western Medical Times*, February, 1920) gives the following plan of a day's menu to serve as an outline, to be modified according to the individual's habits and the seasons:

Breakfast—Fruit (one orange, or a bunch of grapes, half a grapefruit, a baked apple, or a dish of cooked fruit, such as prunes, peaches, apricots); two slices of crisp bacon or two eggs, with two muffins or gems, or slices of toast with butter; or a dish of porridge with cream; and coffee, black or with cream and sugar.

Lunch—A bowl of vegetable soup or puree with crackers; a sandwich, or two rolls with honey; a glass of buttermilk or fermented milk.

Dinner—A bowl of soup; one lamb chop, or a similar sized piece of beef or poultry; two slices of bread; one potato; salad; green vegetables, such as spinach, string beans, asparagus or cauliflower; a dish of pudding of rice, chocolate, gelatine or tapioca with fruit or a fruit sauce.

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REPORTS OF UNUSUAL CASES.

With the Anatomical Diagnosis.

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It not infrequently happens that our most obscure cases remain to us a sealed book, because of the absence of a postmortem examination. On account of the autopsy records the following cases of unusual or rare diseases may be of interest.

CASE I.—The patient was a young man twenty-four years old, who came to the hospital on account of what he termed severe indigestion. He stated that he had always had more or less trouble with his stomach and had had to be careful about what he ate, and he was subject, at irregular intervals, to attacks of abdominal pain accompanied by nausea. The pain had been in the upper part of the abdomen usually, and with these attacks he felt nauseated, but did not usually vomit. He had consulted several physicians, who had regarded the condition as due to chronic appendicitis. The particular attack for which he came to the hospital was similar to other attacks that he had had. It began rather suddenly during the forenoon and was ushered in by abdominal cramps. These pains had increased in intensity, so that he gave up work and went to his room and later came to the hospital. He had been nauseated and had felt like vomiting, but had not done so. When examined he was found to be bordering upon collapse. He was a thin, poorly nourished man, who appeared very ill. The temperature was normal and the patient was bathed in a cold sweat. He localized the pain in the left upper portion of the abdomen. The examination revealed a tympanic note over the left chest, extending to the fifth rib in the axillary line. Over this area the breath sounds could not be heard. The admission diagnosis was pneumothorax based upon these findings. Examined in the ward by one of our staff, the scaphoid appearance of the abdomen and the confirmation of these physical signs suggested to him the possibility of a diaphragmatic hernia. The condition of the patient excluded the employment of any methods of confirming this. The patient did not rally, but died within twenty-four hours after admission to the hospital.

The anatomical diagnosis was diaphragmatic hernia, congenital; the stomach and small intestine were in the left thoracic cavity, the displacement causing a volvulus in the mid portion of the ileum and secondary gangrene of two feet of intestine.

Diaphragmatic hernia, although uncommon, is not excessively rare. The clinical history given by this patient is the usual one, in that repeated attacks of abdominal pain associated with digestive disturbance and vomiting are characteristic. Apparently, viscera may pass in and out of the thoracic cavity under these circumstances, resembling in this respect the spontaneous reduction of usual hernias, inguinal for example, and it is not until strangulation occurs, due often to volvulus and occlusion of the blood supply, that serious symptoms arise. If seen early the diagnosis may be confirmed by radiological examination. The condition is not necessarily fatal, a number of patients having been operated upon successfully and the hernia closed.

CASE II.—A young Italian, twenty-three years of age, was admitted to the clinic complaining of precordial pain, cough, hoarseness, dyspnea and difficulty in swallowing. The history was quite negative up to the onset of the symptoms for which he came to the hospital. Two weeks prior to this time he had begun to have pain in the upper part of his chest, especially on the left side, and about this time he began to be short of breath and have some cough. The hoarseness and difficulty in swallowing developed later. During the taking of the history the patient had several paroxysms of coughing which were characterized by the ward surgeon as "typically brassy."

The patient was a stockily built Italian, with some cyanosis of the face. There was definite, visible pulsation over the upper portion of the sternum, which did not extend into the cardiac region. Dulness could be outlined an inch and a half to the right of the sternum in the second and third costal spaces, and there was a definite heave over this region on palpation. There seemed no question with regard to the diagnosis; all signs and every test pointing to an aneurysm of the arch of the aorta. There was a distinct difference in the blood pressure in the two brachial arteries. Examination of the vocal cords indicated probable impingement of the recurrent laryngeal nerve. The fluoroscopic examination showed a pulsating tumor in the upper mediastinum and the Wassermann reaction was four plus. The patient's downward course was very rapid and death took place from aspiration pneumonia.

The postmortem examination disclosed an aneurysm, as we had suspected, not of the aorta, but of the pulmonary artery. Aneurysms of the pulmonary artery are very rare, there being only a few

reported in the literature. Differential diagnosis is almost impossible to establish, since pulmonary signs which might be supposed to develop are as a matter of fact not infrequently noted with thoracic aneurysms on account of pressure.

CASE III.—Septicemia taking origin in the genitourinary tract. This patient contracted urethritis the latter part of May and was given local treatments, the nature of which are not known further than that they were quite painful. On the fifth of June abdominal pain developed, with nausea and chilly sensations, and he remained at home from his work. The following day, June 6th, he had diarrhea and severe burning on urination. The high temperature continued and he felt so sick that he came to the hospital. On admission to the hospital he had a temperature of 103.6 degrees, appeared very uncomfortable and was slightly delirious. The following day, June 7th, it was noted at the morning examination that the patient was drowsy and that there was a slight ptosis of the right eyelid, the right pupil being larger than the left, and some drooping of the right corner of the mouth. The reflexes were all present but sluggish. No muscular weakness could be determined at this time, nor changes in sensation.

At the afternoon rounds it was noticed that the left leg was definitely weaker than the right and that there were scattered over the body, a few purpuric spots. The eyegrounds were normal. Lumbar puncture was done. The spinal fluid containing 150 cells to the c. mm. A blood culture had been done earlier in the day. A diagnosis was made of a primary urethritis, acute posterior urethritis and prostatitis, septicemia, multiple emboli in the central nervous system and meningitis.

The anatomical diagnosis at autopsy was acute posterior urethritis, acute prostatitis, thrombosis in the prostatic veins, acute vegetative endocarditis of the aortic valve, multiple cerebral emboli, multiple mycotic abscesses (kidney, spleen, liver). The blood cultures showed *Streptococcus hemolyticus*.

CASE IV.—This patient came to the hospital on account of an inguinal adenitis, following a urethritis which had not been treated. The nodes in the right groin were large and fluctuating with considerable local reaction. Following free incision, the patient did well for two days. On the third day, consultation was sought of the medical division on account of considerable rise in temperature, pain in the left chest and cough. It was suspected that pneumonia might have developed. Examination showed that there was undoubtedly fluid in the left chest and exploratory puncture demonstrated this to be pus. The inguinal wound looked clean. The heart appeared to be dilated, but there was no evidence of an endocarditis. There was some debate as to the best therapeutic procedure, opinion being divided as to the necessity of immediate thoracotomy. The smear from the pus in the pleural cavity showed chains of cocci, probably streptococci. The patient was operated upon for empyema and died within twenty-four hours.

The anatomical diagnosis was posterior urethritis, acute prostatitis, thrombosis of the prostatic plexus,

multiple abscesses involving liver, spleen, kidneys and lungs, acute suppurative pleurisy (right), acute suppurative pericarditis. The blood cultures reported after death showed *Streptococcus hemolyticus*.

Generalized blood infections as a sequel to acute posterior urethritis are rather more common than is generally supposed. Two factors stand out as predisposing, namely, excessive vigor in the earlier stages of treatment and the second factor is neglect of all treatment. Genitourinary surgeons appreciate, more than internists are likely to, the important part played by secondary infections in urethritis; indeed the late complications are likely to be due to streptococci rather than to gonococci.

CASE V.—The patient was a woman forty-two years of age, who was admitted to the ophthalmological service on account of rapidly failing vision. Her history was that she had always enjoyed good health, until about six weeks before admission to the hospital. At that time she began to have bleeding of the gums and this had continued intermittently up to the time of admission. The bleeding was not associated with any soreness, but had been persistent and she thought she had lost a good deal of blood and, of course, the bleeding had interfered with the taking of food, because it destroyed her appetite. About ten days before admission to the hospital she had noticed that her vision was somewhat dim. Since then her eyesight had failed steadily until she was unable to distinguish any object, in fact could only see sufficiently to distinguish light from dark. The ophthalmological examination revealed a bilateral optic neuritis of a severe degree. There had been at no time headaches, nor any focal symptoms suggesting implication of other cranial nerves; no symptoms of any kind in fact, except the bleeding gums and gradually failing vision.

The examination was wholly negative. The gums were somewhat spongy and were exuding blood constantly. The blood count was normal. The coagulation time of the blood was normal. The patient was removed to the medical side for further observation. A few days after the transfer signs developed indicating fluid in the right chest. This fluid was withdrawn. It was clear and had the characteristics, chemically and cytologically, of a transudate. Only one abnormal feature was noted in the pleural fluid. In our hunt for a clue to explain the peculiar condition we did everything that was suggested to us and, among other things, the albumin globulin ratio was estimated. The globulin was considerably increased, and to this we attached a significance which was not justified by subsequent disclosures. Repeated examinations of the blood failed to detect anything except severe secondary anemia. In the meantime it was evident that the patient was losing ground on account of the persistent bleeding from the gums and it was felt by the dental consultant that this could be checked only by removing the teeth. Following the removal of the first two teeth the hemorrhage was so persistent that the patient nearly died. Several weeks later we prepared for the second dental operation by transfusing the patient. By stages in this way all of the teeth were eventually removed. The bleeding of

the gums ceased; the vision gradually returned. The fluid in the pleural cavity required aspiration on two separate occasions, after which it ceased to reaccumulate. The whole period of treatment in the hospital covered about four months.

When the patient left the hospital she appeared in good health. Her eyesight, while not normal, was very good and she could read without serious difficulty. There had been no return of the bleeding of the gums or of loss of blood elsewhere. There was, however, very little change notable in the ophthalmological examination.

The patient returned home and remained there for two months apparently improving constantly. Then, rather suddenly, she began to have shortness of breath, which rapidly increased in severity, on account of which she was brought back to the hospital. It was found, at this time, that both pleural cavities contained considerable liquid and aspiration showed that this liquid was deeply blood tinged, so much so that a blood count was made, and it was found that the fluid contained about a million red cells to the c. mm. On the strength of this, the diagnosis of neoplasm was made, the nature and location of which could not be determined. This was not the first suggestion of a neoplastic origin for the symptoms, one of the members of the staff having expressed the opinion that the peculiar atypical symptoms were best explained by the hypothesis of chloroma. Following removal of fluid from one chest there was rapid reaccumulation. The patient failed rapidly and died the second day after admission to the hospital. The diagnosis was chloroma.

Chloroma is a peculiar and rare malignant disease, primary in the bone marrow and giving rise to metastatic growths, chiefly in the skull, orbit, sinuses, and mediastinal lymph nodes, found also quite often in the sternum, vertebræ and occasionally in the long bones. The earliest symptom in many cases has been exophthalmus, less commonly the earliest symptom is blindness or deafness. Hemorrhages do occur, although they are not usual. Various blood pictures have been described and two main classifications have been pointed out, lymphemia and myeloma, but not infrequently leucocytic increase is absent; in other words, there are leucemic and aleucemic chloromas. Certain peculiar cells have been noted in the circulating blood in some cases and these chloroma cells were for a time regarded as diagnostic, but this opinion is no longer held. The axillary or inguinal nodes are sometimes enlarged. In brief, chloroma represents a leucemic process of a definite neoplastic type.

CASE VI.—The patient was a young man who consulted us on account of a sense of compression in the chest and dyspnea. He stated that he had always been in good health; had had no sickness of any importance that he could recall. Two weeks prior to consultation he was injured while playing football, but this injury at the time was regarded as a trivial matter, and he thought nothing of it for several days, when he began to be troubled by a sense of oppression and slight shortness of breath. On examination the signs presented were those of liquid in the left chest, with displacement of the

heart to the right. It was supposed at this time that the case represented the ordinary type of pleurisy with effusion, probably of tuberculous origin. The chest was aspirated and the cell count on the fluid was eighty-four per cent. lymphocytes. The patient ran a fever course after the first few days, his temperature ranging between 97° and 102°, with afebrile periods of ten days or two weeks' duration. The fluid rapidly accumulated after aspiration and paracentesis was repeatedly necessary in order to keep the patient comfortable. In all he was aspirated thirty-four times and forty-two litres of fluid were withdrawn. The fluid was never blood tinged. The prompt reaccumulation of fluid after the earlier aspirations led to a revision of the diagnosis to endothelioma of the pleura.

At autopsy the condition was found to be primary sarcoma of the pericardium, with extension to the pleura and metastases in the mediastinal lymph nodes, likewise those of the peritoneum.

CASE VII.—The first patient was brought to the hospital suffering from apparently a slight infection ("P. U. O."). There was a slight rise in temperature which had come on a few hours before, slight abdominal pain and some vomiting. On examination the patient presented no signs, other than a moderate degree of tympanitis. Especial care was given to examination of the lungs on account of the tympanitis, suspecting that pneumonia might be the underlying disorder. The condition of the patient rapidly grew worse, the pulse became thready, the blood pressure fell and in twenty-four hours after he entered the hospital he was in a collapse and comatose. He died during the second day.

At autopsy no lesion of any sort was discovered, excepting in the adrenal glands. The architecture of these was practically destroyed by numerous hemorrhages which appeared to be recent. The blood cultures which had been made before death yielded a diphtheroid organism. The pathological diagnosis was hemorrhagic suprarenitis.

It is an old clinical adage that rare diseases come in pairs. Our first case of suprarenitis was not recognized before death. The second patient came in with the same history of sudden onset of fever, slight abdominal pain and vomiting. The examination revealed only tympanitis. A few hours after he was admitted to the hospital he had a series of convulsive seizures, which were followed by collapse. The hazardous diagnosis of hemorrhagic suprarenitis was made, because of the similarity of the clinical picture to our first case. The autopsy established the correctness of the conjecture.

Hemorrhages into the adrenals have been described with a number of infectious diseases and I noted them quite frequently during the influenza epidemic at a military hospital. Isolated cases of hemorrhagic suprarenitis must be regarded as a local manifestation of an overwhelming infection. The characteristic features are the onset, resembling the period of invasion of any infection, the rapid downward course, the tympanitis, occasionally convulsions and purpura. Death usually occurs within forty-eight hours.

121 EAST SIXTY-SECOND STREET.

OBSERVATIONS ON THE STIGMATA OF
DEGENERATION AS FOUND IN
THE FEEBLEMINDED.

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"A fellow by the hand of Nature mark'd."

King John, iv., 2.

That stigmata are not only present, but prove a valuable aid in the diagnosis of mental defect, there can be no doubt. But one cannot point to any single deviation from the normal and say positively that it alone is peculiar to any special defect. It is equally true that many perfectly normal people may exhibit some stigmata; but never in such combinations as do defectives. Thus a single anomaly in an individual is not indicative of degeneration; but a combination of three or more will naturally lead the investigator to look for associated mental or moral defects, as in accordance with the now accepted theory, the individual exhibiting from three to five stigmata should be classed as defective beyond a peradventure.

According to Dana two per cent. of normal males present some deviation; while thirty per cent. of the neurasthenics, insane and criminals exhibit deviations and many anomalies are found among the feeble-minded. Perfect mental and physical development usually accord, the intelligence having a decided influence in shaping the head, limbs and trunk.

In many cases there is moral without mental defect; indeed the former may be so marked as to completely overshadow mediocre intelligence. Suetonius's description of *The Twelve Cæsars* is a running commentary of moral without mental degeneration.

In the observation and careful study of mental defectives covering a period of thirty-three years, numbering many hundreds of boys of all grades, I found in each and all innumerable anomalies and in not one case were these absent. Without going into percentages, which are likely to prove tiresome, I briefly note some of the principal stigmata of degeneration found among the feeble-minded:

Many exhibit, superficially, a good physique, but there is almost always a lack of strength, and they tire easily and succumb readily to disease. As a class the feeble-minded are undersized, noticeably the idiots, Mongolians and microcephalics, but some of the brighter ones show increasing growth through the middle grade up to highest, where in many cases they may be normal in height; the acromegalics may reach seven feet—or indeed even more.

There is almost invariably a lack of congruence between the appearance, and the actual or chronological age. Before the age of forty the patients appear much younger; but after attaining this age (which but few of them do, the actual life of a mental defective being from twenty to twenty-five years) they exhibit signs of rapid decay. Not infrequently there is faulty or deficient innervation of the different muscles and hyperhidrosis is common. The hands and feet are in many cases cold and

clammy, especially among those of the low and middle grade.

THE HEAD.

The head exhibits many peculiarities in regard to shape. In addition to the extremes of microcephaly and hydrocephalus there are, in its many asymmetries, frequent deviations from the normal; this is especially noticeable among the low grades. (Note.—The term low grade refers to the imbecile of that type; when the plural is used it includes not only the low grade imbecile but also the idiocretin and idiot.) According to Peterson (1), all length breadth indices between seventy degrees and ninety degrees may be considered as physiological deviations.

The cephalic indices range from seventy degrees to ninety degrees, and the largest number in all grades is eighty degrees; therefore most mental defectives are mesocephalic. The cephalic indices in accentuated cases of mental defect are: Mongolians from seventy-six degrees to ninety degrees, the most common being from eighty-five degrees to eighty-eight degrees, this class being for the most part brachycephalic; acromegaly seventy-three degrees, dolichocephalic; dementia præcox from seventy-two degrees to eighty-five degrees, the most common being eighty degrees, therefore mesocephalic; microcephals from seventy-two degrees to eighty-nine degrees, the most common eighty-two degrees, brachycephalic; moral imbeciles from seventy-three degrees to eighty-five degrees, eighty-five degrees being most frequently found, and, therefore, they also are brachycephalic.

Except in a very few cases the length and maximum width of the skull varies but little in the different grades. The longest faces are found most frequently first among middle grade imbeciles, next among the high and last among the low grades. Unusually wide faces are equal in the high and middle grade, and least frequent among the low grades. The nasobregmatic arc is most pronounced in the high grade, next in the middle and then in the low grade. The craniofacial angle is about eighty degrees in the middle and high grade, and sixty-nine degrees in the lower grades, including idiots and idiocretins. Prognathism is most common in the low grades, and opisthognathism and orthognathism in the middle and high grade. Facial asymmetries are found most frequently on the right side in the high grade, and on the left side in the middle and low grades, including idiots and idiocretins. Squints and tics are about equally distributed in the various grades except in the Mongolian idiots where they preponderate. Depressions over the glabella are equally divided in all grades and are most frequently found among epileptics. The lemurian hypothesis is rather rare but when found is equally divided among all grades. Thick, coarse lips predominate in the low grades—and are found next in middle, and least frequently in the high grade. Fissured lips occur most frequently in the high grade, then in the middle and last in the low grade. Harelip, which is extremely rare, is practically confined to the high grade; and is almost never seen below the middle grade. Perléché is common in the middle and low grades.

THE TEETH AND PALATE.

The largest number of decayed teeth are found among the low grade and idiots; this of course for obvious reasons. Peculiar and badly formed teeth (especially the abnormal length of the canines) are confined to low grades. The notched or furrowed teeth (Hutchinson's teeth) are due to inherited syphilis, and are common to all grades; as are the rachitic teeth, and also the continued presence of milk teeth. The V shaped palate is found most frequently in the high grade, next in the low, and in the middle least of all. The semi V is found in high and low alike; the saddle is most frequent in the high, then middle and then low. Cleft palate is rather rare, but is evenly distributed between the high and low grades. Asymmetries of the hard palate are in predominance on the right side in the high and middle grade, and in the low grades they are found both right and left. The uvula, often short, twists to the right most frequently in the high grade; in the middle and low grades the twist to the left predominates. The torus palatinus is commonly seen in the low grades, next in the high, but is rarely found in the middle grade.

The tongue is noticeably large and thick, and often protruded from the lips of the low grades, markedly so in the cretinoids, Mongolians and microcephals, among whom it is almost invariably fissured deeply with greatly enlarged papillæ. The tongue among the low grades is likely to be square, but among the high and middle grade is pointed. Broad noses are found most frequently in the middle and low grades; while long narrow noses predominate in the high grade. Asymmetries of the nose are most frequent on the right side in all grades; as are deflected septums.

THE EYE.

The eye is the seat of many deviations from the normal. In the moral imbeciles we find the red glint, hard look, and fleeting shifty expression, which is almost impossible to describe. In the low and middle grade strabismus is not uncommon; and in the Mongolian type there are the oblique eyelids peculiar to this class. Visual defects are very common in all grades. Not infrequently there is marked asymmetry of the eyes in middle and low grade; but most common in the low. Nystagmus is found in the high and middle grade. Photophobia is frequent among idiots and low grade imbeciles; and congenital cataract is rather common in all grades.

The thyroid gland is rudimentary or altogether absent in cretins; and in the Mongolians its development is frequently arrested. Goitre is not very common but when present is found in all grades of mental defect.

THE EAR.

The external ear shows a greater number of anomalies than any other organ. Blainville's ear is common to every grade. The concha is largest in the high grade, and sometimes reaches enormous size in the moral imbeciles; and exhibits rudimentary or arrested development in the middle grade. The relation of the concha varies, the left being usually higher in the high grade. Arrested development of the helix is found most often in the

high, especially in moral imbeciles; next in middle and least in the low grades. Excessive development is seen most frequently in middle, then in the low and last in high grade. The open helix occurs first in the high, next in the low and last in the middle grade. Double helix is evenly distributed among all grades. Darwin's tubercles are common, and are found most frequently among the high grade, on the left side of the middle third of the helix; in the upper third they are not so frequent; in some cases they are seen on both ears. In the middle and lower grades they are about equally distributed between the middle and lower third. The antihelix is excessive in high, next in middle and least in the low grades. The tragus is excessive in middle and high grade; and in the latter is very frequently double, especially in the moral imbeciles. When arrested it is confined almost exclusively to the middle grade. The antitragus when either excessive or rudimentary is found in the high grade, especially in the moral imbecile. Double hematoma is found in middle grade; and when single is confined almost exclusively to the left ear. The lobules are most frequently adherent in the middle grade; and next in the high, and sometimes they are entirely absent (Wildermuth's Aztec ear), rudimentary or extremely broad. The long lobule is peculiar to the low grades. Morel's ear is quite evenly distributed in all grades.

THE SKIN.

The skin, while usually of fine texture and normal color in the high grade, deteriorates in the descending scale of intelligence. In the cretins and Mongolians it is pallid or sallow and leathery, and in many cases prematurely wrinkled. Occasionally among the low grade imbeciles and idiots there are brachial clefts, preaural sinuses and nævi of varying size, or areas of pigmentation. In the high and middle grade, there are scars, most frequent among epileptics, due to their numerous falls during paroxysms. In these grades also is seen tattooing (especially among the moral imbeciles), the designs, often of women, being mostly obscene in character; although somewhat favorite devices are hearts and gravestones inscribed with mother, or the names of other loved ones. Mental defectives of every grade are prone to acquire skin diseases, especially the various eczemas.

It may be of passing interest to note that, while not a stigmata of degeneration, blondes and brunettes are fairly evenly divided among the various grades, the former predominating slightly in the high grade, and the latter in the middle and low grades. Brown and gray eyes are found in all grades—the largest number in the middle. Black eyes are noted most frequently among the high grade and blue among the low grade.

THE HAIR.

Black hair is distributed equally through all grades. While yellow and red hair are most common among the middle grade, red hair is almost never seen among the low grades. In the high grade brown hair is most frequent, as also in the low grades. The beard is usually heavy in all grades, and in the middle and low grades it is very

coarse; but in some cases there is absence of beard. The eyebrows frequently meet and may be heavy and bushy in the high and middle grade; while in the low grades they are scanty or absent. In many of the high and middle grade there is a lack of hair on the body; but not infrequently in the low grades tufts of coarse hair are found in the sacrolumbar region, and on the abdomen.

In three cases I have seen a heavy growth of coarse, curly, black hair, enveloping the body like a jacket. The pubic hair in all grades is usually very heavy and thick; but occasionally in the low grades it is altogether absent. In cases of dementia præcox and microcephaly I find an absence of hair on the chest; which according to Lanceraux is indicative of a tendency to tuberculosis. This I have seen verified in a number of cases. In the middle and low grades there are sometimes congenital spots of baldness; and hairy moles on face and trunk; and patches of gray hair may appear in very early life.

THE EXTREMITIES.

The arms are found to be asymmetrical first in the middle, and next in the low grades; especially the Mongolians. Hands are largest in the middle grade; and are asymmetrical in all grades. The cretins and Mongolians invariably have short clubbed fingers. Polydactylism and webbed fingers are rather rare, and are confined to the low grade and idiots for the most part. Left handedness is also rare, and confined almost exclusively to the middle grade. Occasionally the high grade are ambidextrous, especially the moral imbecile.

The legs, asymmetrical, are longest and shortest in the middle grade. Small feet are found most frequently in the low grade; and next in the high. Large feet are seen often in middle grade, and also in low. Flat feet are very common in the middle grade, and in Mongolians. High instep is found highest in high grade, and lowest in low grade. The various talipes are found to some extent among all grades, especially talipes planus, as are hammer toes.

Funnel breast, *thorax en entonnoir*, is found in the lower grades, especially the Mongolian; and *pectus carinatum* or pigeon breast among all grades; but most often among the middle and low.

The kyphotic pelvis is seen almost exclusively among the lower grades, as is the scoliotic pelvis; and the elongation of the coccyx, suggestive of the stump of a tail, is found among the lower grades, especially the idiots.

Heavy, thickened, pigmented nails are very common among the middle and lower grades, and many have flat furrows extending the entire length, giving a rough appearance. When heavily ridged—generally transverse—they are called neurotic nails, and are frequently found among the high grade. Many are addicted to onychophagy, or biting of the nails. This occurs to some extent among the middle and high grade, but rarely among the low grades.

The male generative organs are worthy of attention as exhibiting marked deviations from normal. In all grades the penis is greatly enlarged both in length and circumference. Phimosis is the rule, and not the exception in all grades, as are

epispadias, hypospadias, and cryptorchism. Masturbation is common in every grade, even the profound idiot. Aspermia, and azoospermia are found mostly among epileptics of all grades. There is retarded genital function, as well as sexual desire, and loss of sexual power, in all grades; but when roused there is excessive exaggeration which in many cases exceeds all bounds often amounting to satyriasis. Atrophy of the sexual organs is not very common. In rare cases there is so-called hermaphroditism among the high grade, especially the moral imbecile.

Defective vision, hearing, taste and smell, as well as anosmia are found most frequently in the middle and low grades, especially the latter. Defective hearts are found in all grades, but most frequently among the middle and low; especially are they to be noted among the Mongolians and microcephals. Mitral and aortic regurgitation are common, as is tachycardia. Hemophilia, or uncontrollable bleeding, is occasionally encountered in the middle grade. Mirror writing is not infrequently seen, and always in the high grade. Many, especially among the low grades, are insensitive to pain, and will take great delight in watching the setting of a broken bone or the amputation of their own fingers.

Speech is retarded in all grades. Stammering occurs mostly among the high, and next among the middle grade; while among the low grades it is rare. There is defective articulation among all grades, but it is most pronounced among the low. Burring and lisping occurs among the high and middle grade, but almost never among the low grades. Semimutism and mutism are found principally among the middle and low grades. Weak digestion is rare; and all grades are gormandizers and are likely to overeat. Constipation is common in all grades, but markedly so in the low, in which it may alternate with diarrhea; and many are persistently unclean both night and day. In a large number of cases, in all grades, there is both retarded dentition and locomotion; and they are much slower in learning to dress and undress than normal children; and are awkward in the use of their hands; and lack of prehension, as well as poor station may be noted, especially among the middle and low grades. Epilepsy and chorea are common in all grades.

The high and middle grades are sometimes diffident in meeting strangers; but as a rule they are egotistical, and are so fond of attracting attention that they will go to almost any length, even resorting to selfmutilation. The moral stigmata are always prominent, and in many cases exceed the physical. The high grade, and especially the moral imbecile, are veritable artists in crime, and usually brutal and cruel, and always crafty and cunning, deceitful and untruthful; mendacity amounts almost to an art, their lies being simply wonderful.

There is a lack of true affection; and gratitude among the mentally defective is by no means a lasting quality. They are all adroit thieves, and are extremely cunning in gaining their ends; but as they have little acquisitiveness, and only a very limited appreciation of relative values, they will steal for no reason whatsoever except the excitement. As a rule they are not revengeful, but are

generous and kindhearted to a degree; their emotions are easily stirred; and they are lazy and sluggish in habits. In sexual perverts a mincing gait is noticeable, and feminine appearance and actions; and there is a peculiar shuffling walk among the lower grades which is often a mere lurching forward. All grades have phenomenal memories for peculiar things—dates and unimportant events, but the residual or practical memory is almost always very deficient.

The following deviations from normal, common to all grades of the feeble-minded, occur so rarely that I call attention to them simply as a matter of record; although when present, especially in combination, they are indisputable indications of degeneration.

The head.—Cephalones without hydrocephalus; trigonocephalus, oxycephalus, plagiocephalus, sphenoccephalus, trochocephalus, leptoccephalus, platycephalus.

The eye.—Megalophthalmus, microphthalmus, microphepharon, symblepharon, colomba palpebræ, coloboma iridis, coloboma choroideæ, congenital; coloboma lentis, congenital; epicanthus, aniridia, polykoria, corectopia, staphyloma posticum scarpal, arteria hyaloidea, retinitis pigmentosa, hemeralopia, daltonism, acrometropsia, nyctalopia, dermoid adhesions on cornea.

The ears.—Stahl's ears No. 1—No. 2—No. 3; faunonian or satanic or pointed ear.

Thorax.—Gynecomastia or excessive development of breasts.

The extremities.—Defective extension of fingers; excessively long hands and fingers; great strength and abnormal development of left hand and leg; congenital luxations, aplasia of extremities, hypoplasia of extremities, micromelus, apus and abrachius, peropus and perobrachius, ametus, phocomelus, perometus, sympus apus and sympus opus, monobrachius and monopus, achinus and perochirus.

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THE TYPES OF CARBONATED BRINE BATHS (NAUHEIM).

A Discussion of Their Comparative Values.

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In 1857 Beneke observed that carbonated brine baths had a very decided effect in influencing the course of diseases of the heart and circulatory apparatus. This was contrary to the current opinions held by the medical profession at large and the physicians practising at Bad Nauheim. Prior to Beneke's observations, which he subsequently proved, the carbonated brine bath was held to be dangerous to heart patients. However, the treatment had been occasionally risked on a few patients with heart disease when the rheumatism of which they chiefly complained was so painful that relief was imperative, despite the possibility of the traditional hazard of life involved in the therapeutic effort. Beneke

was not tardy in recognizing that the beneficial effect of the baths in these few cases was due not alone to the effect upon the rheumatic condition, but to a great extent to the general tonic effect upon the heart and circulation which indirectly influenced the rheumatic condition.

This briefly outlines the history of the development of carbonated brine baths as a therapeutic agent for cardiovascular renal diseases. The method has been developed and scientifically elaborated by such men as the Schotts and the Groedels in Germany, and by Baruch in this country. From the time that Nauheim became recognized by the profession as the Mecca for heart patients, attempts have been made to duplicate this bath by two classes of individuals, physicians and laymen, with two definite purposes in view. Physicians have labored to develop the artificial bath that their patients might have the advantages of this form of therapy without incurring the expense of a trip to Nauheim or without necessitating the complete separation of themselves from their domestic and community relations.

The other set of individuals, composed of laymen, have followed in the development of the artificial bath, not actuated so much by the scientific enthusiasm of the therapist but rather with the purpose of profiting financially from this therapeutic venture calculated to interest the hundreds of heart patients in this country by methods of commercial advertising at once insidious in its suggestions and ambiguous in its promise of benefit. An avenue of publicity is sought that is contemplated to reach and attract the public eye rather than the discriminating judgment of the profession through the popular magazines. An ethical way is offered to reach the profession directly, and the public indirectly, by the publication of scientific observations through the pages of the current medical journals. If as much money was spent on developing the scientific methods in vogue for diagnostic and therapeutic purposes as for commercial publicity the return on the investment within a few years would be proportionally commensurate to the thoroughness of the work accomplished.

Because of the claims and counterclaims that physicians constantly hear concerning this and that kind of Nauheim bath this article has been written in an endeavor to classify properly the various types of baths in existence and to evaluate comparatively the merits of each.

Carbonated brine baths (Nauheim baths) are divided into three kinds, as follows:

1. The natural carbonated brine bath.
2. The partially natural carbonated brine bath.
 - a. Using natural carbonated water and artificially prepared brine.
 - b. Using a natural brine water in which the carbonation is artificially prepared.
3. The artificially carbonated brine bath.

Type 1 is to be found only at Nauheim and is the ideal bath.

Type 2, a, as a bath, *per se*, is on a par with Nauheim, as it possesses the most important constituent part of the carbonated brine bath in its natural form of occurrence. It is a matter of common knowledge that the proper physiological action of the bath is

directly dependent upon the efficacy of the carbonic acid gas saturation throughout the brine water. In a natural carbonated brine bath or in a partially natural carbonated brine bath in which the carbonation is natural and the brine artificial, there is such an ideal distribution of the carbonic acid gas throughout the water as to permit the gas bubbles properly to insulate the immersed skin area against a too rapid dissipation of body heat and to stimulate the skin with a thermic stimulus of heat imparted by the gas bubble because of the difference of the point of thermic comfort between that of carbonic acid gas and the water of the bath. In a bath in which the carbonation is natural there are successive crops of gas bubbles that adhere to the skin and provide for a fresh insulation of the immersed skin and facilitate more adequately the physiological action of the gas bubbles than in the bath in which the carbonation is artificial.

Type 2, b, is on a par with the artificial bath. The carbonation is artificial and it is obvious that since the most important physiological factor of this bath and of the artificial bath are the same, that the therapeutic merit must necessarily be equal. Claims have been made that the natural brine was distinctly advantageous over the artificial brine, but the observations of others, as well as my own, have failed to substantiate this clinically. Assuming a proper proportion of calcium and sodium chloride in solution for each bath there is no reason known that confirms the claim of superiority of natural brine water over artificially prepared brine water. Therefore, any claim of this sort is to be discounted. It is merely a connivance calculated to associate in the mind of the reader a similarity of this natural brine water to the natural carbonated brine water of Bad Nauheim. The reader, unlearned in hydrotherapeutic lore, is misled by the mental processes of logical reasoning sequence to ascribe inferentially to this natural brine water an equivalent value to that of the natural carbonated brine water of Nauheim, which does not exist.

Type 3 is the artificial bath and is the equal of Type 2, b. This is borne out by clinical results.

Summing up, it would appear that Bad Nauheim, in point of the bath alone, has distinct advantages that have not been exactly duplicated but are capable of duplication at Saratoga, N. Y. The bath of Saratoga Springs, N. Y., represents Type 2, and when the "method" has been more scientifically elaborated should equal Nauheim as a heart cure. It has no rival in this country in point of natural assets as a heart cure.

However, at this point it is well to call attention to a handicap existing at Saratoga for heart patients. This handicap is the laxative mineral waters. Laxative mineral waters have been used for years in cardinals, based upon a time honored but time worn idea, "elimination." The unprescribed use and abuse of laxative waters by cardiac patients is dangerous, and it is to be hoped that Saratoga will ever exert a restraining influence over the personal inclination of the heart patients to indulge while being treated there.

Type 2, b, having no advantages over the arti-

cial or Type 3 bath deserves discussion in association with the artificial bath. These baths are capable of benefitting cardiovascular renal disease, and while they are not as valuable, *per se*, as Type 1 and Type 2, a, they are nevertheless worthy substitutes.

There are a few places in this country where a brine water similar to Bad Nauheim's is to be found. It is to be hoped that in the event of the development of health resorts at these sites that it will not be because of this natural brine, but because of a conscientious attempt to establish a substitute for those patients unable to journey to Nauheim. The natural brine possesses no inherent advantages for the carbonated brine bath. That it renders the administration of baths less troublesome and less expensive than artificially prepared brine is quite obvious. The profession, I am sure, would gladly support an establishment whose prime interest was directed at the aggressive development of a health resort for heart patients. If a scientific equipment of such an establishment was kept abreast of modern medical progress there would be no need for worry about its financial success. However, the profession cannot be pledged to support an establishment whose atmosphere scents more strongly of commercial interest than of scientific progressiveness.

I have attempted to classify the types of carbonated brine baths (Nauheim baths) in use, basing this classification upon the results of recent advances made in this form of therapy as well as upon personal observations extending over a period of six years. It is my desire to give to those of the profession unfamiliar with this therapy a correct impression of the comparative merit of the different types of baths, so that they may wisely counsel their heart patients as to the advantages of this treatment as well as to advise correctly some despairing patient who may have become enthusiastically confused by advertisements craftily designed to attract his interest by inferential statements which are so indeterminate of tangible fact as to lead him to question the accuracy of his conclusions. If this has been accomplished I shall indeed be repaid for my efforts.

109 EAST SIXTY-FIRST STREET.

THE RESULTS OF OPERATION IN GASTRIC AND DUODENAL ULCERS.*

By GEORGE WOOLSEY, M. D., F.A.C.S.,
New York.

The following study of the results of operation in gastric and duodenal ulcer is based upon 109 cases in which I operated, mostly during the last five or six years, up to December, 1919. This does not include acute perforating ulcers. A few of these 109 cases, principally those of gastric ulcer for which a gastroenterostomy or an excision was done, date further back, but are included for a comparison of the results, as I have done relatively few operations of these types for gastric ulcer in recent years.

*Read before the Surgical Section of the New York Academy of Medicine, May 7, 1920.

Seventy-nine of these operations have been done since January, 1916, at which date the followup system was inaugurated in the second surgical division of Bellevue Hospital. Only one of these was done in 1918, so that the period covered by this group was three years. I have succeeded in getting return or late records in seventy-six of these cases, sixty-two of the operations having been performed since January, 1916. The time after operation of these return records varies from about three months to 110 months, and averages 16.4 months. Those patients who had no gastric symptoms were classed as excellent; those having occasional vague symptoms, not those of ulcer, were classed as satisfactory. The remaining class of unsatisfactory results included those patients who complained of considerable abdominal discomfort, though it was rarely suggestive of ulcer and probably depended for the most part on adhesions and other extragastric causes. There were seven post-operative deaths, five in the period since January, 1916.

Naturally the largest group was that of duodenal ulcer, of which there were fifty-eight cases, but this was only a little over fifty per cent., a low ratio considering the average run of duodenal compared with gastric ulcers. Two of these patients died after operation, one of pulmonary embolism and one of heat prostration, a mortality of 3.4 per cent. The heat prostration would have been prevented had we recognized how hot it was; it occurred at the beginning of an intensely hot spell. Of the remaining fifty-six cases I have return records of forty-five. A number of these patients have come back to the return clinic several times, or I have seen or heard from them repeatedly.

The immediate results, or the condition on leaving the hospital, was excellent in seventy-five per cent. of the cases; satisfactory in 15.9 per cent., and unsatisfactory in nine per cent. The late results, which are the real test of the value of the operation, were excellent in 64.4 per cent.; satisfactory in 26.6 per cent., and unsatisfactory in 8.8 per cent. Combining the excellent and satisfactory groups, which give what may be called the good results, shows that the immediate good results were 90.9 per cent., and the good results nine per cent., which are practically identical. In a series of twenty cases of duodenal ulcer I employed pyloric exclusion by using a strip of fascia from the rectus sheath, according to Wilms's method, in addition to gastrojejunostomy, but thinking that it made little or no difference and only added to the time of operation, I discontinued it. However, on comparing the late results in cases with and without exclusion I unexpectedly found that the cases with exclusion gave the best results. Of the twenty cases I have late reports of nineteen, giving excellent results in 59.9 per cent.; satisfactory in 36.8 per cent., or good results in 94.7 per cent., and only 5.3 per cent. of failures. Of the twenty-six cases without exclusion, twenty-five reported, giving excellent results in sixty-eight per cent.; satisfactory in twenty per cent., or good results in eighty-eight per cent., with twelve per cent. of failures. This may, however, be too small a number of cases to afford a fair

comparison. The exclusion is only intended to be temporary, to afford the ulcer a chance to heal without being irritated by the passage of food; but in one case, fluoroscoped fifteen months later, the pylorus was still occluded.

Suspicion of a simultaneous chronic appendicitis led to the removal of the appendix in sixteen out of forty-eight cases, usually through the median incision, though in three cases a separate muscle splitting incision had to be employed, and in three others the appendix could not be delivered in the epigastric wound. In six more cases the appendix had been removed previously, and in three of these the patient dated the epigastric localization of the symptoms from shortly after the operation. It is undoubtedly true that a number of patients are operated upon for chronic appendicitis who, in addition to or instead of the latter, have a duodenal or gastric ulcer. Appendectomy coincident with gastrojejunostomy does not appear to influence favorably the final result in the cases so treated in this series. The gallbladder was removed in four cases, but only once for stones, the other three times because it was left so raw, after freeing its adhesions to the duodenum or stomach, that fresh massive adhesions seemed inevitable.

A symptom or condition sometimes mentioned by patients on being questioned as to the results, is constipation. In several the bowels, constipated before, were regular after operation; in a smaller number the reverse condition existed. The results in patients who were constipated after the operation, compared with the nonconstipated patients, show this difference, that there are more excellent results, as compared with satisfactory results, when the bowels are regular than when they are constipated. Eructations of gas or sour fluid is another symptom of frequent occurrence. It was noted before operation three times as often as after. It may become quite a matter of habit, and in all but one of the cases noted after operation it was also noted as present before.

In one case the symptoms of ulcer recurred after twenty-one months, and all forms of diet and treatment had no effect. On operation (gastrotomy), two years after the first operation, about three inches of silk or linen thread was found hanging from the inside of the anastomosis. Another three inches was pulled out of the site of the anastomosis. There was no jejunal ulcer. The symptoms were entirely relieved at once. This thread was the outer or serous suture. This was a symptomatic recurrence, but the Mayos have shown that such nonabsorbable sutures are probably the commonest cause of gastrojejunal ulcer. Since that time, four and a half years ago, I have used no nonabsorbable suture, only No. 0 chromic gut, so that nearly all the operations in this present series have been so performed. In a number of these cases we had the benefit, in diagnosis, of a large series of plates taken by Dr. Cole, in clinical cases at the Cornell Medical School. The x ray diagnosis was in each instance confirmed by operation. These patients were also fluoroscoped independently by Dr. A. L. Holland, with practically identical findings. The

great value of fluoroscopy is shown in one of the more recent cases in which an operation had been performed, where Dr. Holland was able to diagnose a duodenal ulcer only after forcibly pressing the stomach aside. The hospital plates did not show the ulcer.

In the group of gastric ulcer cases treated by gastroenterostomy I have included all that I have private records of, going back to 1902, as the group would otherwise be too small. There are eighteen cases in this group, with no postoperative deaths, making a mortality of 2.6 per cent. for all cases of peptic ulcer in which a gastroenterostomy only was done. Among the early cases were three of pyloric stenosis, with dilatation of the stomach, giving remarkably successful results in the relief of symptoms, the patients putting on weight and returning to a normal, active life. The first two operations were done with a Murphy button by the anterior method. The second patient had such a large indurated mass in the antrum that I took it for a carcinoma and told his family that I did not think he could live over a year. Two and a half years later I saw him in perfect health and doing his full work, having gained forty pounds in weight, and I heard of him fourteen years after operation living in California in perfect health.

We ordinarily think that a gastroenterostomy is not adequate to cure a gastric ulcer, except those directly at the pylorus. That some at least of the chronic ulcers can be cured by gastroenterostomy alone is shown by another case, in which the patient was operated upon over nine years ago for an ulcer whose crater could readily be felt on the posterior surface, near the middle of the stomach, adherent to the pancreas. This patient I heard from recently. He is not sick a day, has done hard physical labor since operation, and is nearly seventy years old. In this case a posterior gastroenterostomy could not be done on account of posterior adhesions, so I brought a short loop of the jejunum through the mesocolon and then through the gastrocolic omentum and anastomosed it to the anterior surface of the stomach, making what may be called a retrocolic anterior gastroenterostomy. Since then I have used this method in two other cases of this group and in several resections, mostly for carcinoma. It has always given most satisfactory results; in fact the best results that I have had in gastric carcinoma have been obtained in this way.

Another patient of this group is interesting as having been operated upon at another hospital for perforated ulcer, without gastroenterostomy, seventeen months before. A year later he had a recurrence for which the gastroenterostomy was done, with an excellent final result. There is considerable difference of opinion among surgeons as to whether a gastroenterostomy should be done in perforated ulcer if the patient's condition warrants it. Though this is one of only two cases where I have seen recurrence, I have always preferred to do a gastroenterostomy and feel that the reasons for this course given by Paterson, of London, are quite sufficient.

This man had a stormy and interesting convalescence. Three days after operation, and again seven

days after, he had a large hematemesis with melena. Nine days after operation, the hemoglobin being ten per cent, and the blood pressure so low that it could not be counted, he was reoperated upon after a transfusion of 1100 c.c. On opening the stomach the edges of the stroma were found to be smoothly healed and the source of the hemorrhage was found to be the ulcer. There was no further serious hemorrhage and he made a good recovery.

In this series of gastric ulcer cases treated by gastroenterostomy the late results are known in fourteen, being excellent in eight, satisfactory in three, making 78.5 per cent. of good results. In the three cases marked unsatisfactory one patient when last seen four months after operation, gave an excellent report, but three months later she wrote that she was hopelessly sick, without specifying in what way. Another patient was well for eight months when he began to have stomach symptoms at times, especially vomiting, but no gastric pain. He was operated upon again sixteen months after the first operation and the pyloric end of the stomach resected. Since then he has been free from gastric symptoms, but is still neurotic and has a peculiar pallor, though the blood examination is quite satisfactory. The third patient was entirely well for nearly three years, when gastric symptoms, with hematemesis, returned. His habits of eating, drinking, and smoking were alone enough to provoke symptoms of recurrence of ulcer. On resecting the pyloric end of the stomach the stoma, made at the first operation, was found entirely closed, the only case of the kind that I have met with.

A rather recent case was that of a hydrochloric acid burn where the effects of the acid were confined to the antrum, the distal two inches of which were contracted to a mass with thick walls and narrow lumen, sharply demarked from the rest of the stomach. The symptoms were those of pyloric stenosis and were entirely relieved at once by gastroenterostomy. The effect of the acid is strikingly different from that of a strong alkali, which is exerted mostly on the esophagus and the cardia. Apparently the acid caused a pyloric spasm which retained the acid in the antrum and thus concentrated its action on this portion.

In the few more or less recent cases in this group the ulcer was situated at or close to the pylorus and in five cases a pyloric exclusion was done, proximal to the ulcer, to encourage its healing; but without affecting the final result very favorably. I am inclined to think that the results would have been better if most of these later cases had been resected by the Polya-Reichel method. The best results obtained by gastroenterostomy in the gastric ulcer group have been in chronic pyloric stenosis with dilatation of the stomach. The group of gastric ulcers treated by excision is a small one, only seven cases. The first two cases were treated without gastroenterostomy and were unsatisfactory. A gastroenterostomy was performed later in one of these cases to relieve symptoms and a good result was obtained only after excluding the pylorus at a later operation.

I am firmly convinced that excision alone is a poor operation for gastric ulcer. It seems to interfere with gastric motility and does not relieve hyper-

acidity. Combined with gastroenterostomy, excision, or better perhaps the Balfour cautery operation, may give good results. Excision comes in competition with mesogastric resection, but although the postoperative course of the latter has been very smooth, the final results have not been as good, so that my early enthusiasm for this method has somewhat abated. There are also a few cases of gastric ulcer, well toward the cardiac end, where mesogastric resection is more difficult. At least two in the excision group were of this type and both gave good results. The last one of these is of special interest. A woman aged sixty years had been explored by another surgeon, who found only adhesions. The stomach symptoms continuing she was fluoroscoped by Dr. Holland, who found a very small perforating ulcer posterior to the lesser curvature, about five inches from the pylorus. This was seen only in an oblique view and did not show on the hospital x ray plates. It was found at operation, excised, and a gastroenterostomy done. Owing to its posterior position I could not reach it well with the cautery and it was not suitable for mesogastric resection.

In a group of twenty-six cases of gastric ulcer treated by resection of the stomach four patients died, a mortality of 15.3 per cent. It is interesting to study these four fatalities, all done by the Billroth II method. One patient took the anesthetic badly, pneumonia developed and death occurred on the third day. Another, a man of sixty, had had a gastroenterostomy for ulcer three and a half years before and, though a hard drinker, had been well for three years after operation. He was doing and feeling well on the third and fourth days after operation, but on the fifth day edema of the lungs developed and he died. A postmortem showed serious chronic lesions of the lungs, kidneys and liver. The other two patients had profound anemia from gastric hemorrhage. The first had 830,000 red cells and fifteen per cent. of hemoglobin. He was operated upon immediately after a transfusion of 900 c. c. He did well for several days and then became weaker. Efforts to obtain a second transfusion failed and he died on the seventh day. The second patient had 1,900,000 red cells, thirty-five per cent. of hemoglobin, and lived twenty-five days, finally dying of progressive anemia. This man, fifty-five years of age, had cirrhosis of the liver and a gritty adherent spleen, of approximately normal size. It must be admitted that of these four patients three were very poor risks, two on account of profound anemia and one because of advanced chronic visceral disease. It would have been wiser to do a gastroenterostomy only, in the anemic patients, leaving the resection to a second stage.

Of the remaining twenty-two patients sixteen have reported the late result. Of these six gave an excellent result, seven a satisfactory, and three an unsatisfactory one, making 81.2 per cent. of good results. In one of the unsatisfactory cases, in which a mesogastric resection was done, the patient was reoperated upon six months later, when adhesions narrowing the distal segment were found and freed and a gastroenterostomy done, proximal to the resection. Eight months later the result was excel-

lent, making 87.5 per cent. of good results and 12.5 per cent. of unsatisfactory results. The two remaining unsatisfactory cases were both of mesogastric resection. One was moderately successful for over two years, but the patient was a heavy drinker and was syphilitic. Gastric or duodenal symptoms had recurred after alcoholic excess, when the patient was last seen two and a half years after operation. Hematemesis, occurring repeatedly before operation, had not recurred. The other patient returned five months after operation with gastric symptoms. The x ray suggested a new growth at the pyloric end, although no evidence of this had been found on microscopic examination of the ulcer. He refused operation and was lost track of.

In gastric ulcers situated at or near the pyloric end I do a resection, preferably by the Polya-Reichel technic. If the antrum is normal and the ulcer is three to four inches or more proximal to the pylorus I have done a mesogastric resection. Where the ulcer is so far from the pylorus as to make this operation quite difficult, an excision, or the Balfour cautery method, with a gastroenterostomy, is preferable.

This group includes eight mesogastric resections with no deaths. At first I was strongly in favor of this method, which has the advantage of not requiring a gastroenterostomy, but I have been disappointed with its results. The convalescence is usually smooth and satisfactory. Only five cases have been heard from and, after reoperation in one case and the addition of a gastroenterostomy, the satisfactory results comprise only sixty per cent. It may in justice be said, however, that many of these cases presented the worst types of chronic ulcer in unpromising specimens of humanity. I believe that it has its place in gastric surgery. Five out of the eight ulcers were situated posteriorly and adherent to and sometimes penetrating the pancreas. Excision and cautery are not suitable in these cases and a complete resection involves the removal of a large segment of the stomach. In such cases, adherent posteriorly, I believe that mesogastric resection is indicated.

Four patients were operated upon by the Billroth II method and both of the cases with return records gave good results, one satisfactory and one excellent, the latter done by the retrocolic anterior gastroenterostomy method. It is a striking fact that in four cases of gastric ulcer in which this method was employed, on account of adhesions posteriorly, the end result has been excellent in all in which it is known. But the number of cases is too small to justify definite conclusions. The Polya-Reichel method was used in nine cases, of which eight reported, with five excellent and three satisfactory results, or 100 per cent. of good results. This operation has given much satisfaction. It saves time, as compared with the Billroth II method, and, according to the voluntary testimony of the house staff the postoperative convalescence is smoother and more satisfactory. The Polya-Balfour method was employed with satisfactory results on one patient who had previously been operated upon elsewhere, and in whom the Polya-Reichel technic could not be used on account of adhesions posteriorly. Carcinoma is

known to have developed in one of the eighteen cases of gastric ulcer, not resected, after five and a half years of entire absence of gastric symptoms. The operator could not tell whether it originated in the stomach or pancreas. It caused persistent jaundice. In another case of mesogastric resection the x ray gave a suspicion of malignancy. It is noticeable that the results in private practice are appreciably better as there have been no unsatisfactory results in my private cases. In the majority (71.5 per cent.) of these 109 cases the ulcer has not been removed or cured by the operation. The latter merely puts the stomach in such a condition, mechanically and chemically, that the healing of the ulcer is favored. In addition then these patients should have a dietetic cure and the postoperative period offers ideal conditions for this regimen. A few patients, after obtaining complete relief, have so abused their stomach by alcoholic and dietetic excesses as to bring on recurrence of ulcer or of gastric symptoms.

Again, if bacteria from the gums and teeth sockets are an etiological factor in producing ulcer, we can not expect, much less obtain, continuous satisfactory oral conditions in the majority of hospital patients. In the matter of diet or oral sepsis conditions may continue or recur which caused the formation of the original ulcer and which favor the development of a new one. This applies particularly to hospital patients, and in this class it is important, by education, the follow up system, social service, and similar means, to secure such conditions that the good results may be permanent. In a given case of gastric or duodenal ulcer we cannot guarantee a good result from operation, but we can assure such patients that in a very large proportion of cases, eighty-five to over ninety per cent., suitable operation offers good results, both immediate and lasting. This holds where medical cures have been tried and failed. In fact, in many of these cases, relapses have occurred after one or several such cures, and ulcer patients should be urged to first take such cures if they can give the time for thorough treatment by rest and diet. The relapses after such treatment will leave many patients who should be urged to try operative treatment.

117 EAST THIRTY-SIXTH STREET.

PEPTIC ULCER.

Clinically and Röntgenologically Considered.

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(Continued from page 63.)

VOMITING IN ULCER.

Vomiting is not a common factor in the ordinary uncomplicated peptic ulcer. It occurs rarely in the duodenal ulcer and is more common in the gastric ulcers. When stenosis takes place, due to cicatricial pyloric ulcers, then vomiting may become a daily occurrence and will depend upon the degree of stenosis. The vomitus in the severe grades of stenosis is large and has the classical appearance of a gas-

trectasia vomitus presenting several layers of food secretion and containing food ingested a day or so before the vomiting.

Such vomitus is pathognomonic of stenosis and when associated with symptoms of ulcer, a diagnosis of callous ulcer of the pylorus can promptly be made. In minor grades of obstruction vomiting takes place at longer intervals. In the gastric ulcers situated about the lesser curvature forming the so-called Haudeck niche, vomiting occasionally takes place at the height of digestion and is due to the irritation set up by the hyperacid contents as well as by coarse food particles being rubbed against the ulcer base. The gastrospasm is so intense that vomiting takes place in the attempt on the part of the stomach to rid itself of the irritating agents. In this type of ulcer vomiting takes place without any obstruction being present, the ulcer usually being several inches away from the pylorus. In one case of chronic perforating ulcer situated high up near the cardia on the posterior wall, the gastrospasm was so intense that vomiting took place immediately after the introduction of food into the stomach before it had a chance to reach the caudal portion. In simple duodenal ulcer vomiting is the exception and will only occur during an attack of marked pylorospasm with retention of hyperacid secretion. Here the pain and burning is so intense that reverse peristalsis sets in and the irritating contents are brought up. When vomiting does not take place spontaneously these patients often induce vomiting by introducing the fingers in back of the pharynx. There are of course cases when a temporary obstruction is brought about by pylorospasm. In vomiting without pyrosis or without any definite relation to meals and other factors other conditions must be looked for to account for its cause.

HEMORRHAGE.

Gastric hemorrhage due to ulcer is computed to take place in about thirty-five per cent. of the cases. It may occur at any time during the course of the disease. It may often be the first symptom in a case of ulcer with an ill defined ulcer history elicited from the patient only after the hemorrhage has occurred. The hemorrhage is usually severe in the deeply eroded ulcers when larger arteries are involved. Often a blood transfusion may be necessary to save life. In duodenal hemorrhage there may be no vomiting of blood. Syncope may be the first symptom, followed by abdominal pains, pallor, rapid pulse and all the characteristic phenomena of acute bleeding. Later, melena develops. There may appear at first a bright red movement when there is a rapid peristalsis and evacuation takes place immediately. This will invariably be followed by tarry stools. If the blood continues to be bright red then the bleeding is from the lower bowel. When hemorrhage takes place in gastric ulcer, vomiting occurs which is bright red and is large in quantity. In the duodenal ulcer when regurgitation of blood occurs in the stomach, the vomitus may be dark red or coffee ground due to retention and admixture with hydrochloric acid.

CHEMISTRY.

In the consideration of the chemistry of the stomach as a diagnostic factor in ulcer, one must

relegate this method considerably behind all others. Taken alone it has no value, for who would dare to commit himself definitely as to the diagnosis of an ulcer upon the chemistry alone? It surely can be done in fifty-five per cent. of the cases by the anamnesis and in as many cases by the study of the röntgen plates. Even a study of the gastric contents in all its phases by the Rehfuß method of fractional titration at fifteen minute intervals continued for two hours will not *per se* settle the diagnosis. The continued late hyperacidity is present in all duodenal irritations whether due to gallbladder disease, or appendicitis, or even epigastric hernia when adhering and pinching the omental tissue. Even carcinoma is not immune from late hyperacidity. With all that, however, it has its place and is of definite value as an adjuvant. Aside from the chemical reaction there is other valuable information to be obtained from an examination of the gastric contents, such as quantity, consistency—or the degree of chymification, color, the presence of mucus, blood, and if on a fasting stomach, the presence of food particles whether macroscopical or microscopical. Again the finding of a hypoacidity or an anacidity such as in achylia gastrica, will at once help us to rule out an ulcer. It may be safely stated that this negative anacid phase is of greater value than the positive hyperacid phase; for while the latter can only be a hint of the possibility of ulcer, the former will exclude it and indicate the presence of another disease. Truly it may be stated that ulcer may sometimes occur in the presence of achylia. These cases are extremely rare and can always be differentiated by the Gluczinsky test, consisting in the administration of a meat meal and removing the contents at the height of digestion when some free acid will invariably be found when ulcer is present.

The interest centered about gastric analysis is still of greater physiological than diagnostic importance. To quote from Rehfuß: "In a résumé of 842 complete curves on various food stuffs with more than twenty thousand titrations we found that forty-five per cent. exceeded one hundred total acidity and after a study embracing three years' work we are prepared to state that no acid figures occurred in disease which could not be duplicated in health. In other words we found that forty-five per cent. of all responses in health showed so-called hyperacidity, while forty-two per cent. of my ulcer series showed the same thing. In other words there is no greater incidence of high acid figures in ulcer or in any other gastric diseases than in health, a fact that raises the extremely important question as to whether an actual demonstrable hyperacidity ever does occur."

Physiologically, however, gastric analysis imparts to us the knowledge of events of gastric digestion as follows: 1, The response of the organ to the direct stimulus of food as well as the psychic; 2, the change from the fasting secretion to a secretion of higher acidity; 3, the control mechanism of the acid content by the duodenal regurgitation. This latter is evidenced by the finding of trypsin and bile at certain phases of the digestive cycle. To compare the merits of the Rehfuß fractional method

of examination with the older Ewald method is not within the province of this paper. Suffice it to state that both possess meritorious advantages. The Rehfuß method informs us of every phase of digestion at fifteen minute intervals from the time of ingestion of the meal up to the end of digestion, comprising about two hours.

Rehfuß has constructed a curve of the normal secretion where the maximum rise of acidity is reached at the end of an hour and then gradually declines to zero at the end of digestion. He further attempted to classify the pathological departures from this normal curve and impart to them diagnostic significance. For instance, a sharp rise within the hour would indicate a gastric ulcer. A rise which continues high and is sustained to the end of the second hour, he designated as duodenal ulcer. Neither of these is pathognomonic and may be found in all cases of increased irritability of the autonomic nervous system, the lesion residing in any one of the abdominal organs. The fractional method also indicates, with a fair degree of accuracy, the time of tryptic regurgitation and if occult blood is found simultaneously with tryptic regurgitation it may point to a duodenal ulcer. The significance of occult blood with the old method of extraction is perhaps valueless as the larger tube may produce sufficient capillary traumatism to give a Benzidin reaction. The advantages from the Ewald method of examination are first, that a better knowledge can be obtained as to the rate of emptying of the stomach, and second, by withdrawing larger quantities, its physical characteristics as well as the amount of mucus can be better studied. By attempting half hourly extractions with an Ewald tube we can approach the Rehfuß method.

Occult blood in the feces.—The presence of occult blood in the feces when the examination is carried out under proper precautions is significant. There are too many factors of safety which minimize the value of the test. The patient must be on a meat free diet for three days. Precaution as to bleeding gums, hemorrhoids, or any other ano-rectal bleeding is to be observed. Such extreme care can only be followed in an institution. Finally the presence of occult blood in carcinoma is a constant factor.

PHYSICAL EXAMINATION.

Physical examination offers only the most meagre information in the diagnosis of peptic ulcer. The so-called tender point upon which the older textbooks lay so much stress cannot be relied upon to corroborate the diagnosis. It is not always present and if too much importance be attached to it one would miss the diagnosis in the majority of cases of peptic ulcer. It manifests itself only when the ulcer is in an active stage, during an exacerbation of symptoms. When the ulcer is large and deep enough; when in the course of ulceration it has reached or closely approximated the visceral peritoneum; when it is in an active inflammatory condition and an exudate is being thrown out; when there is an associated perigastritis or periduodenitis present, only under such conditions is the tender point manifest.

RÖNTGENOLOGICAL EXAMINATION.

Next in importance to the anamnesis in the diagnosis of peptic ulcer is the röntgenological examination; in fact, so closely associated has it become with the routine gastroenterological examination, and so dependable, that scarcely a clinician today will commit himself to a definite diagnosis until it has been substantiated by the röntgenological findings.

History.—Rapid strides have been made in the progress of the röntgenological interpretation of gastrointestinal lesions. The development of the röntgen ray in the diagnosis of gastrointestinal diseases dates back to 1906 when Hemmeter first attempted to demonstrate the site of an ulcer by the adherence of a fleck of bismuth. He was then called a visionary. With the advent of the Rieder meal, however, Riecher succeeded in 1909 in visualizing the cavity of an ulcer and Hemmeter's dream came true. Shortly after, in 1910, Haudeck described in detail the penetrating and perforating gastric ulcer and called it *nischen symptom*, to which his name has since been attached, and it is now known as the *Haudeck niche*. Simultaneously Schlesinger was enabled to set down definite classifications of the various types of stomachs according to their morphology as seen by the aid of the contrast meal, and Holzknrecht, in studying functional manifestations in health and disease was able to formulate the hypothesis of group symptom complex in the various forms of ulcer which has since been called the Holzknrecht symptom complex. A host of observers abroad, Kästle, Rosenthal, Grædel and others added gradually to the morphology, biology and motility of the stomach under normal and abnormal conditions. Simultaneously in this country Pfahler, Carman, Case, Hirsch and others continued independently along similar lines of sign complexes. In 1911, Lewis Gregory Cole, in this country, by the aid of serial röntgen examinations introduced the epoch making studies of deformities of the duodenal cap which has since been established as an absolute sign of duodenal ulcer.

With the visualization of the Haudeck niche, and especially so with Cole's demonstrations of duodenal defects, dates the birth of the direct method of interpretations of peptic ulcer. The advent of this demonstration threw a new light on the method of röntgenological examinations and placed its accuracy on firmer foundations. It tended to revolutionize the older method of indirect examination by the direct method of studying organic structural changes. The trend in this country of late has been to rely chiefly on the latter method, so much so that many röntgenologists and gastroenterologists have totally discarded the symptom complex. The fallacy of disregarding the expression of a disturbed physiological function of an organ under abnormal influences will be pointed out later on. The unbiased observer cannot fail to regard the direct method as of primary importance and the indirect method as of secondary or contributory value. Unfortunately, however, the direct method is not adaptable to all types of cases. Certain localizations of the ulcer cannot be directly visualized. Ulcers in the posterior wall of the vesti-

bule and pars pylorica cannot be seen. A fair proportion of ulcers, if too small or if situated on the posterior wall, are also missed if followed only by the direct method. In the latter type of cases the secondary or indirect method is employed to very good advantage, and the percentage of diagnoses is largely increased.

Before entering into a detailed description of the various methods of examinations, it is important to possess a full knowledge of the normal röntgen ray anatomy of the stomach, as well as its normal physiological functions as observed with the röntgen rays. The following factors have to be considered: 1, Type of the stomach (size, shape, position, axis); 2, tonus (the response or the behavior of the gastric musculature to the introduction of food); 3, outline; 4, mobility and flexibility; 5, peristalsis; 6, gastric secretion; 7, motility.

Type of stomach.—The type of stomach varies with the habitus of the individual, i. e., with the bony framework, the muscular development, and the degree of intraabdominal pressure, which regulates the tone, shape, size, and position of the stomach. There are several types of stomachs. Adopting the Schlesinger classification according to tone they are as follows: a, hypertonic; b, orthotonic; c, hypotonic, and d, atonic. While dissimilar in their röntgen appearance, varying in length, breadth, capacity, position, axis and tone, all are considered normal, each corresponding to the different status of the individual.

a. The hypertonic type, called by Holzknrecht the steerhorn stomach from its configuration, fits the individual of the status apoplectic, i. e., the individual with robust frame, short and wide thorax, and wide epigastric angle. The position of the stomach, like all abdominal organs, in this habitus is high, assuming an extreme oblique to a transverse axis. Relatively small in size it is broadest at the fundus and tapers down at the pylorus which is the most dependent portion. Forsel explains the hypertonic type somewhat as follows: The influence exerted by the strong abdominal muscles and the surrounding abdominal organs causes an increased intraabdominal pressure which accentuates the tone of the musculature of the most active part of the stomach, the so-called sinus (Forsel) or vestibule (Cannon) or antrum pylori. The stimulus thus exerted from without, as well as the high diaphragmatic and liver attachments, causes the lower portion of the stomach to straighten out assuming a transverse position. The pylorus reaches considerably to the right of the median line and the greater curvature is displaced upward about four to six inches above the umbilicus. This type of stomach is generally found in males and is less commonly met with than the other types. When the intraabdominal pressure is increased from other sources, such as pregnancy, obesity, and ascites, the steerhorn type is also encountered.

b. The orthotonic or fishhook type of stomach is the most common form of stomach. It occurs in the medium slender individual. It is the so-called syphon form of Rieder and resembles the letter J. It descends vertically downward from the diaphragm to the level just below the umbilicus.

The pylorus then rises upward for several inches forming a pronounced *incisura angularis*. The pylorus usually overlies the middle or the right border of the spinal column. It has the capacity of maintaining its contents in a tubular form. The diameter of its lumen is equal throughout. The stimulus exerted here from a uniform intraabdominal pressure causes an even contraction of the entire gastric musculature, assuming the vertical or fishhook type.

c. The hypotonic stomach occurs in the individual of the status asthenicus (*habitus enteroptoticus* of Stiller) with weak abdominal muscles, flat abdomen, poor panniculus, long narrow chest with low diaphragm, and correspondingly low position of all the abdominal viscera. The stomach exhibits a relaxation of its longitudinal muscular fibres and is therefore increased in length and is more capacious. It lies entirely to the left of the median line and its most dependent portion sags down into the pelvis. The upper part is narrowed by an approximation of its walls. The deficient intraabdominal pressure robs the stomach and all the abdominal viscera of support, resulting in the stretching of the ligamentous attachments as well as the musculature of the hollow viscera.

d. The atonic type shows the muscular relaxation to an extreme degree and manifests an exaggeration of all the weaknesses of the hypotonic stomach. It forms a borderline between the normal and the pathological stomach. It is met with in the literature under various names; the *hubhöhe* of Haudeck or the water trap stomach of Satterlee and Le Wald. Variations and transition forms between the various types are common. Modifications between the orthotonic and hypertonic or orthotonic and subtonic types are very often met.

Tonus.—Tonus characterizes the muscular tonicity of the organ and is evidenced by the mode of filling when food is introduced. It signifies the behavior of the gastric musculature when a morsel of food enters the cardia or represents the contractility of the muscular walls to direct stimulus of food introduced into the stomach. The stomach in the empty state lies collapsed into a narrow saugeshaped tube, the walls, barely approximating each other. In its uppermost portion under the left diaphragm, overlies the gas bubble or *magen blase* whose size and shape vary according to tone and to the presence of a fasting secretion. In the hypertonic and orthotonic stomach it is usually small. It increases in size in the hypotonic and is largest in the other type. In the collapsed organ it assumes a pearshaped form with the apex below. The *magen blase* in cases of the latter type may be so large as to cause an eventration of the left diaphragm exerting considerable pressure upon the heart. When secretions are present the *magen blase* is supported by the fluid level and appears with a broad, flattened, horizontal base. When food is taken the first portion of it comes down through the cardiac sphincter and stops just below the *magen blase* for several seconds. The duration varies according to the state of muscular contractility or peristole of the stomach. It is largest in the hypertonic and orthotonic types of stomachs. It then slowly slides down tapering below to the

apex of a triangle. Shortly after it is seen to come down along the lesser curvature in a narrow cylindrical form until it reaches the caudal portion. As food continues to enter, it keeps to the lesser curvature and fills excentrically, i. e., from the lesser curvature outward, the greater curvature being pushed downward and outward, the stomach distending chiefly in width. The lesser curvature in virtue of its anatomical muscular arrangement forms a groove called the groove of Retzius or the road of the stomach (*magenstrasse*). In the hypotonic stomach the temporary delay is lessened and is totally absent in the atonic type. The meal is seen to drop rapidly into the caudal portion filling the stomach from below up, only the lower half remaining filled, the walls in the tubular portion collapsed and approximating each other, differing strikingly from the orthotonic form wherein the muscular walls possess the power of sustaining its contents uniformly in a tubular or cylindrical form.

Outline.—The outline of the stomach when filled is smooth and regular, broken only by the *incisura cardiaca* just at the junction of the esophagus with the stomach and low down by the *incisura angularis* at the junction of the *pars media* and *pars pylorica*. One even sees frequently a broad indentation at the greater curvature under the left costal arch due to pressure.

(To be continued)

GASTROINTESTINAL DISTURBANCES IN AFFECTIONS OF THE OCULAR MECHANISM.

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The more thoroughly we become acquainted with gastrointestinal manifestations, the more convinced do we become of the fact that their creation often has its generic stimulus in dysfunction of other apparently remote organs. This stimulus through the medium of the nervous system affects the alimentary apparatus in such a manner as to give rise to the many symptoms commonly ascribed to the stomach and bowels.

For years I have from time to time suspected in many stomach sufferers the existence of visual disturbances by inference, after having noted carefully the facial expression or facial carriage. Upon investigation I elicited that the ocular apparatus was more or less unsuccessful in its efforts properly to adapt itself to an adequate appreciation of the environment. This visual disturbance was found in many instances in individuals who had no suspicion of its presence. Upon questioning them regarding their vision they invariably remarked that their eyesight was faultless or that they never experienced any ocular difficulty. In just such cases does this unconscious ocular disturbance emphasize its importance and frequency as a cause of visceral disorder. The intermediary part that the nervous system plays in this condition is, of course, most important and essential in the creation of the symptoms under consideration.

The ocular conditions ordinarily encountered in the production of these disturbances are anomalies of the eye muscles and refractive errors. Either of these types of eye affections are capable of inducing profound reflex or referred visceral manifestations.

The recognition of the dependence of abnormal body poise and abnormal body expression upon abnormal adjustments of the eyes was forcibly brought out by Stevens (1) a few years ago. The resulting development of peculiar facial expression, of decidedly improper body carriage and of improper physiological chest action was stressed, and the distinct association of diseases of the muscles of the neck and face, diseases of the nervous system, such as chorea, epilepsy and other neuroses with ocular affection had been established. It had even been taken for granted that as a consequence of these disturbances other secondary diseases, such as pulmonary tuberculosis, diseases of the blood and other diseases, followed. We are not absolutely certain in stating how eyestrain lowers an individual's resistance to the extent of rendering him susceptible to dreaded disease, but it seems not improper to suppose that the nervous system is the great medium wherein the damaging stimulus takes its profound hold. It is in this manner, I feel certain, that original disturbances of the stomach and bowels are created from set up excitation in the eyes. Through the medium of the nervous system, either as a conveyor of abnormal stimulation or as a creator of remote disease through its abnormal responsiveness to stimuli, the function of the gastrointestinal tract suffers and as a result for a time our patient suffers from symptoms of neuroses affecting the organs of that tract. These symptoms are commonly found and exist for long periods of time as purely functional expressions until as a result of their overaction definite organic disease establishes itself. This, in my opinion, is the probable manner of creation of visceral disease, not only from the eyes as a source of original irritation, but also from irritation in almost any distant organ.

In this paper, however, we are concerned with the eyes as disturbers of gastrointestinal poise, and it seems that emphasis upon a condition known as ocular declination is indicated. Often patients having no other errors of vision will upon close investigation show declinations of the vertical meridians of the eyes. This condition must always be borne in mind and looked for else its presence will escape detection. This alone may often be the causative factor back of a profound gastrointestinal neurosis. The strain to which the eyes are subjected in this condition is of sufficient moment reflexly to arouse alimentary disruption. Of course, other eye anomalies that are commonly present and more easily recognized, such as refractive and heterophoric errors, will also very often set up digestive disturbances. Before continuing, it might be well to emphasize the fact that any of these ocular disturbances need only be developed to an apparently slight extent and yet may reflexly create severe gastrointestinal symptoms. These eye conditions may consist of either a refractive error alone or a muscle anomaly, and may also at times occur in combination. Following are the

records of two cases, each typifying a distinct ocular anomaly:

CASE I.—Young lady, aged twenty, was referred to me by her brother, who is a physician. This patient had been undergoing observation and treatment at the hands of a number of physicians for months. She was being treated for gastric disease. She gave no evidence of improvement under their care. Her chief complaint was nausea and vomiting. She is of slightly nervous temperament, ate rapidly and drank considerable tea and coffee; had typhoid fever eight years ago. Her present illness began eight months ago with headaches. She had had these terrific headaches off and on for eight months, for which she had been treated by a number of physicians. During the seven weeks prior to my seeing her she had suffered from attacks of vertigo, nausea and vomiting, which occurred as a rule while eating the first morsel of food or immediately after finishing her meal. She never vomited during a total abstinence from food. The vomiting attacks would often continue as long as four hours at a time. These vomiting attacks would most often be followed a few hours later by a profuse diarrhea. These gastrointestinal attacks would occur every few days and would leave the patient in a highly irritable, discouraged mood, as a result of which she would have crying spells. She also gave a history of irregular menstrual function. She had lost fourteen pounds during the past three months, and she presented an emaciated appearance. Physical examination was practically negative, except for a palpable right kidney and slight refractive error. The eyes showed O. D. + .50 — O. S. + .50. Upon inquiry regarding her vision, she contended that her vision was fine and always had been good. Testing her eyes with a Snellen chart convinced me that my suspicion of ocular error was correct. She was fitted with proper glasses and as a result all symptoms disappeared immediately. She has been free from all symptoms for over seven months.

CASE II.—Young lady, aged twenty-seven. Her chief complaint was nervousness and epigastric soreness. Except for frequent attacks of tonsillitis, no further history of important past illness. She was also treated by a number of physicians before I saw her for this condition. The last diagnosis made was that of gallstones. Her present illness began about a year ago with a feeling of general nervousness, a sensation of heaviness in the epigastrium after meals, and attacks of cold hands and feet. She was nervous most of the time. Experienced a shaking sensation in the epigastrium frequently, with no relationship to her meals. She often had a feeling of profound faintness in the epigastrium, at times excessive sweating and cardiac palpitation. The appetite was poor, breath offensive, excessive gaseous eructations, and the abdomen was distended most of the time after a milk diet. Lately had had many diarrhetic movements and attacks of frequent urination. There was a slight loss of weight. The foregoing symptoms plainly indicated disturbance of the vegetative nervous system (vagal portion). Physical examination was practically negative. There certainly was nothing about her physical condition

to suggest a diagnosis of gallstone disease. Her eyes evinced the existence of a slight refractive error and a declination of the eyes. The eyes showed, as in the first case, O. D. + .50 and O. S. + .50 and a declination of the retinal meridians to the right, of only slight degree, however, and affecting only the vertical meridians of the eyes. The simple correction of these ocular difficulties has ameliorated the condition of this patient to such a vast extent as to make me feel that the original cause of the vagal neurosis was in the eyes. Just as in the former case, this patient had no knowledge whatever of the existence of these anomalies in her eyes and thought it very strange that I should lay so much stress upon her organs of vision. The improvement, however, speaks for itself.

It is very evident from the foregoing that subjective gastrointestinal complaints often result from eye disturbances, and it would seem to me that almost any eye disturbance is capable of producing enough irritation to reflexly bring about these complaints, but those most common are anomalies of accommodation, refractive errors and disturbances of the eye movements. It would also seem, here, that a reemphasis of the importance of looking into the question of declination of the meridians of the eyes is indicated. Many eyes are constantly being examined by specialists who seldom look into the condition of the meridians, and as a result a very important factor in the probable creation of reflex disease is overlooked. Many patients, again, owing to the fact that they subjectively experience no trouble with their eyes often lead the physician away from his path of proper diagnosis. Instead of anomalous eyes in these cases setting up eye symptoms, they set up reflex visceral manifestations. To this condition, in which ocular anomalies give rise to no subjective eye symptoms, I have ascribed the title unconscious ocular disease. Eyestrain, conscious or unconscious, is a rather common condition and by all means requires attention, for through its removal or mitigation the general welfare of the patient can be decidedly improved. It seems that eyestrain so conditions the reflex visceral arcs as to result in the establishment of many untoward body symptoms, and these symptoms often show a predominating relationship to the vagus, hence the condition is spoken of as a vagal neurosis. The above cited cases were pure neuroses, yet the physicians in attendance were prone to view the symptoms from an organic viewpoint. After an extensive study of gastrointestinal complaints I feel certain that most of us would agree that the occurrence of gastrointestinal neuroses far outnumbers organic diseases of this tract. For that reason let us eliminate eye difficulties in our search for a cause of gastrointestinal disease. Attention to this matter in my practice has ameliorated the condition, if not entirely cured many of these disorders.

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768 WEST END AVENUE.

DISEASES OF THE RIGHT UPPER QUADRANT.*

Medical Aspect.

By M. B. KUNSTLER, M. D.,

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New York.

We may consider the right, upper quadrant from either the subjective or the objective point of view. The latter is by far the more accurate, for frequently the patient complaining of trouble in this region upon further examination will reveal a far distant lesion; on the other hand, one must also be wary of objective findings since we may get many signs pointing to right, upper quadrant disease, when in reality no such trouble exists. Right sided pleurisy or pneumonia, subphrenic abscesses, herpes zoster, and many other diseases may cause symptoms in the right quadrant resembling, in every way, diseases of the organs in this region and may even bring the patient to the operating table.

The organs included in the region under discussion are the pylorus, duodenum, pancreas, liver, gallbladder, kidney, colon and at times the appendix. To discuss all diseases of each organ would manifestly be impossible, so I propose, simply, to mention the most common disorders and then to discuss, briefly, the subjective and objective symptomatology.

The pylorus.—The most frequent conditions met with at the pylorus are ulcer and carcinoma, the former being by far the commonest. Stenosis of the pylorus, also quite common, gives symptoms in the epigastrium rather than the right quadrant.

The duodenum.—The only common disease here is ulcer although strictures, dilatation and carcinoma arising from the ampulla of Vater have been described.

The pancreas.—Here we get carcinoma, cysts and calculi. All of these are rather rare and give symptoms more in the umbilical and epigastric regions than in the upper, right quadrant. A rather common condition, however, is pancreatitis, either acute or chronic and most often associated with gallbladder disease.

The liver.—Such common conditions as cirrhosis, congestion and syphilis of the liver being more general than local disease need no discussion here, although they often complicate other conditions. Of the local diseases we have tumors and cysts and abscesses. The cysts are almost always due to the echinococcus and the abscesses to the ameba but may also be caused by colon bacillus.

The gallbladder.—Since gallstones were found by Mitchell (1) in three per cent. of sixteen hundred postmortems and by others in five to ten per cent. of cases we must realize how extremely common gallbladder conditions are. Cholecystitis and cholelithiasis are the most frequent, and it appears that females are affected much more than males, and those past forty in the majority of cases. Gee says: "In women past middle age gallstones are so common that one is not wrong to be always suspecting them." The other gallbladder disease of any

*Presented before the New York Diagnostic Society, May 26, 1920.

importance, to be considered, is carcinoma and this is so rare as compared to the previously mentioned diseases as to be almost negligible.

The kidneys and adrenal glands.—It becomes important at times to differentiate kidney diseases from the others. Calculi and infections of the kidneys are perhaps the most frequent conditions, but tumors and hydronephrosis must be kept in mind, as well as perinephric abscesses.

Colon.—Carcinoma is the only disease in this portion of the colon that needs consideration but we must not forget the frequency of reflected symptoms when other portions of the colon are affected.

The appendix.—A high appendix, at times, gives symptoms entirely localized to the right, upper quadrant and must be differentiated from the other acute diseases in this region.

In considering the symptomatology of the right, upper quadrant I propose taking up the principal subjective and objective signs and point out a few differential points.

The cardinal symptom and the one causing the patient to seek medical advice is pain, and the principal finding in diseases of this region is tenderness. We may divide pain into several classes as: 1, the pain of carcinoma, whatever its location; 2, the colics; 3, the pain of ulcer; 4, that of pancreatitis, and 5, of liver diseases. In carcinoma the pain is more stationary and constant, usually worse at night, and of a dull, boring character. There is no relief except by opiates, the one exception being in those rare cases of carcinoma of the stomach with hyperacidity, when alkalis may relieve it somewhat. Gallstones and renal colics cause an agonizing pain that has a tendency to radiate, the former to the right scapular region, and the latter toward the pubis. Relief may be spontaneous with the passage of the stone but usually opiates are required. Appendicular colic is neither so severe nor so steady as the former and has not the tendency to radiate. The pain in ulcer is sharp, gnawing and burning and usually bears a distinct relation to the taking of food which relieves it as do vomiting and alkalis. At times it shows a tendency to radiate toward the left scapular region. Acute pancreatitis gives one of the most severe pains, being cutting in character and prostrating the patient. The pain in liver disease (cyst or abscess) in which I include cholecystitis is more of a dull pressure and is localized to the liver region. It is at times made worse by taking a deep breath and by bending.

In this case, I believe, the subjective signs are worth more than the objective signs for the tenderness in these diseases is quite indefinite, except in cholecystitis and ulcer. In the latter it is usually superficial and localized to the epigastrium, while in the former it is deep and corresponds to the position of the gallbladder or on a line between the umbilicus and the right shoulder. In kidney diseases the tenderness exists in the costovertebral angle and carcinomas cause tenderness wherever they exist. With tenderness we may consider rigidity of the right rectus muscle, which is present in almost all conditions in this region, and is of little

diagnostic value. Masses may also be felt including enlarged gallbladders, kidney tumors, pancreatic cysts or carcinomas and gastric tumors. Of these the gastric tumors are the most mobile and those of the pancreas least so.

Indigestion is next in frequency to pain and includes belching, heartburn, loss of appetite and nausea and vomiting. The principal diseases causing loss of appetite are gallbladder conditions or carcinomas, regardless of their location. The difference is that in carcinoma the patient has an absolute aversion to food, especially meat, while in gallbladder trouble the loss of desire is due to a rather constant nausea. In the latter it is surprising how well nourished the patient remains, even though the anorexia has existed for some time, while in carcinoma a rapid loss of weight occurs. Ulcer patients do not eat simply because they are afraid, but we find that the desire for food is present. They are usually spare and anxious looking, but show no evidence of any marked or rapid loss of weight.

Vomiting may occur in any disease, being of most frequent occurrence in gallbladder or renal colic, appendicitis, ulcer, carcinoma of the stomach and pancreatitis. The vomiting is probably reflex due to pain, but in ulcer or carcinoma it may be due to obstruction. In carcinoma it is of almost daily occurrence and is of a foul, coffeeground character, while in the former it occurs only rarely and gives immediate relief from the pain, a phenomenon that happens in none of the other conditions. Heartburn is often complained of, but the cause is not so frequently corroborated by stomach analysis. Thus, gallbladder patients may complain of it, but I have found that they more often have a tendency to achylia, due, probably, to a gastritis. Ulcer and chronic appendicitis most frequently give a hyperacidity, the latter being much less in degree than the former.

Constipation is another frequent accompaniment of the diseases under consideration and is most marked in ulcer, gallbladder diseases, appendicitis and carcinoma of the colon. In the latter the stool becomes small and may contain blood and mucus.

Jaundice occurs in carcinoma of the pancreas, gallstones, cholecystitis and some of the liver diseases. In the former it is constant, progressive, and of a greenish hue. In gallstones it is more variable and of a yellow color. In cholecystitis, while jaundice is not so marked we commonly get an icteroid tint to the skin, which usually exists in the various liver diseases.

I wish to call attention to certain general points which may bear a part in the diagnosis. The presence of a secondary anemia is of importance in diagnosing carcinoma, providing the other signs are present and a positive Wassermann, or a pernicious anemia, as shown by blood examination may be of extreme value. The consideration of age and sex are of value for gallstones are most frequent in elderly females, while ulcer is found mostly in young males. When carcinoma develops on an ulcer the change of symptoms, rather suddenly, is quite characteristic and should always be considered.

46 WEST EIGHTY-THIRD STREET.

TREATMENT OF TUBERCULOSIS.

Clinical Case Reports.

BY BENJAMIN S. PASCHALL, M. D.,
New York.

Some one has aptly said that it would take a lifetime to prove or disprove the usefulness of any new method of treatment in tuberculosis. However that may be, we think that twelve years is a sufficient length of time to get a fair degree of accuracy in the case of the substance we are about to describe. The results have been so accurate and consistent in both animals and man and the observations have extended over such a comprehensive series in both groups that the conclusions reached will be found to approach very closely the statements made in the following pages. It was shown in the animal experiments that one could predict to a remarkable degree of accuracy just how a given group of guineapigs would appear at autopsy as soon as the standardization values of a given strain of tubercle bacilli had been learned, and that these results could be predicted with the same degree of accuracy as can be obtained in the usual toxin antitoxin measurements obtained in the standardization of diphtheria antitoxins.

We began using mycoleum as far back as 1908, but were soon stopped by our first disastrous laboratory fire, which put a check on our supply for nearly a year. Even at that time it was sufficiently perfected to be entirely satisfactory on experimental animals and so far as we could see in its clinical results, the only drawback being our utter inability to produce an adequate amount even for the few patients who were then taking it.

A consideration of the pathology of tuberculosis is essential in connection with its treatment by any specific means, since the commonest or caseous form of this disease corresponds to a similar condition seen in syphilis in the tertiary stage, the stage of gumma. Primary and secondary stages are seldom seen in tuberculosis but they exist nevertheless and they may be very clearly demonstrated in the experimental animal. Pulmonary forms of tuberculosis are particularly comparable to the tertiary forms of syphilis, so that we might say first, second, third, and fourth stages of tertiary tuberculosis when referring to the usual physical lung findings plus the pathological realizations. In attempting to gain an insight into what our expectations should be in the case of a new and valuable therapeutic agent to be added to our armamentarium let us not lose sight of this pathological vision lest we expect things to happen in a different manner from what will actually prove to be the case.

In the first place antibodies particularly lipases penetrate very slowly into walled off or partly walled off areas of necrosis or into areas of caseation, while tubercle bacilli can lie in these areas without being destroyed for long periods of time. So closely do these caseous areas resemble the gumma that their separate identity was unproved until the discovery of the bacillus by Koch.

In the second place, wax lipases of a specific nature obey the physiological laws commonly recognized as governing the action of fat lipases and are

not called forth and activated except when one of these areas softens down and liberates natural tubercle bacillus waxes into the surrounding tissues or blood stream, or when mycoleum is injected to increase artificially the quantity of these antibodies already present, that is either the real wax or the wax modified as I have already described (2) must be present to activate these antibodies. Therefore destruction of tubercle bacilli can proceed only when there is first an adequate amount of wax splitting antibodies present in the tissues and second when there is physical contact between the bacilli and the enzymes in question.

Upon these facts, by the way, rests the great divergence of results reported by various investigators on the reliability of certain complement deviation tests in the diagnostic field in tuberculosis, for while the nonwaxy portions of the bacillus play such an important rôle in these serological reactions the strictly waxy portions themselves are exceedingly irregular and uncertain in their results for the reasons stated. Of course the wax lipoid proteid carbohydrate complex when used as an antigen is not separated in its entirety by purely physical methods, which further complicates the already complex deviation aspect of the case.

From the foregoing remarks it will be readily appreciated that the rules for treatment must closely follow our present understanding of the most modern methods for treating syphilis. That the time of treatment, the alternation between active courses of treatment and periods of rest between, and the indications for more active courses or longer periods of intermission must bear a striking resemblance to this pathologically similar disease, with the single exception that in the case of tuberculosis treated with mycoleum we are raising the immunity dose by dose steadily and surely to a higher and higher level until finally there comes a time when the patient fails to react any further and is apparently cured.

Sometimes this high level is not maintained and reactions will reappear after a sufficient interval but it is surprising to note the number of patients who once they are brought to this level will hold it to such a degree that a dose administered one, two, and three years later will fail to elicit the slightest response even in some patients who reacted so continuously and so violently that it sometimes seemed as if we never were to arrive at the end of the disease process. These are in general the old chronic fibroid types of the down and out class. Of course, we do not like to treat them and we avoid them as much as possible, but they occur too frequently and are too insistent in their claims upon us to be entirely ignored. For the first year or so there does not seem to be anything happening of an encouraging nature. They are just patiently hanging on of their own accord because we do not encourage them, since we never know in this class which ones have enough lung tissue left and which have not. After the first year, but more often after the second, it becomes unmistakably apparent that the patient is getting well.

And at the end of the third and fourth and fifth years they are still going up, steadily climbing and never slipping backward. One can only wonder how

much punishment the human body can stand and then recover, if given the right chance to do it and time enough to do it in. We cannot ignore these men and women in the future. They will insist that we treat them through the long and weary years. They are the most patient and the hardest to discourage and they are satisfied with so little, but let us try in the future not to have them get this way if we can avoid it, and I think that we can.

There is nothing so common in the world as the practice of selfdeception in nearly all human affairs. That we avoided this from the first was due to the extreme difficulty in producing an adequate amount. It takes from three to six months to prepare a dose and a few seconds to give it, and the number of doses which can be prepared at a given time or in one lot is exceedingly limited. There has never been an adequate amount for us to use in our own practice, and there is not at the present time enough to treat more than a very limited number of patients, so limited that the taking on of a single new patient should have long and serious consideration as to whether or not we can manage it.

Every effort is being made at the present time to make mycoleum available by going into quantity production methods, which will be an engineering task of large and expensive proportions.

The difficulties in producing mycoleum were so great that in the beginning we actually hoped against hope that some substance easier and cheaper to prepare would turn out to be the proper immunizing substance. At first we discounted the very positive reports which a considerable group of patients began to turn in, some of them exceedingly glowing reports on their sudden and unmistakable improvement. We discounted them on the grounds of anything new. Then the laboratory burned out again and we were again without mycoleum for several months. I made a frantic search over the United States for any quantity of dried tubercle bacilli at that time, and I want to take this occasion to thank the biological laboratories and the state experiment stations which helped me out.

Owing to our inability to obtain more than a few ounces of dried tubercle bacilli at the best from the whole country, we tried to put our patients back on tuberculin. They refused and decided to wait for the new laboratory. Some of them waited too long and when we again had it they no longer were capable of reacting. Others reacted once more and again began to make that same unmistakable climb back toward health. It was the first clear cut indication I had that whatever difficulties there might be in the way of producing this substance and whatever its cost of production might be, some way must be found to make it available to sufferers from this disease.

Some of these patients had been with us during the previous fires, and so we had seen patients who were failing on tuberculin in 1908 start gaining on mycoleum in 1909, begin losing again in 1910 when our first fire happened and tuberculin was resumed, gain again in 1911 on retreatment with mycoleum, lose ground again in 1912 on resuming tuberculin once more on account of our second fire

and again start improving in 1913 on mycoleum, when they were finally treated to ultimate recovery.

Prior to 1910 the doses of mycoleum were small as compared to those given at a later date. It was plainly seen that even these doses had a distinct retarding action on the course of the disease in the severe forms and a markedly beneficial effect in the milder forms. It was only after we had very greatly enlarged our incubator facilities that the doses could be increased, and the dose at present given was finally determined to be the minimum amount which would prove sufficient to provoke a lasting immunity in the largest majority of cases. It has, however, been determined that if this standard dose does not provoke a reaction no amount of increase will have the slightest effect. It has already been shown that it is harmless on the experimental animal in practically any amount. I have given the human dose of three c.c. to a tuberculous guineapig without harm.

There are a number of complications and sequelæ which deserve a moment's attention, though they might well be reserved for a future discussion in which methods of treatment are more fully taken up. Accumulations of pus from bone tuberculosis must be evacuated at the earliest possible moment. There is no danger of secondary infections and sinuses discharging over long periods of time. Mycoleum will take care of this feature with promptness and accuracy. On the other hand failure to evacuate pus promptly keeps mycoleum from exerting its specific action and may cost the patient his life.

Patients with intestinal tuberculosis may make a splendid recovery and die from a subsequent obstruction due to adhesions caused by the disease.

Renal tuberculosis is quite as amenable to treatment as are other forms, but a contracted bladder remains a constant discomfort and does not improve much as years go on. It is not advisable to treat renal tuberculosis where the injected bladder does not hold six ounces, unless the patient is highly intelligent and understands thoroughly that there is going to be less and less capacity, even an almost immediate cessation of the process. Long continued toxemia may have left permanent changes in the organs of metabolism and elimination, and these degenerations are not capable of regeneration.

Immunity does not often take place before the age of three, but recovery as late as seventy-five is not uncommon. Alcohol and tobacco depress the blood capability, and excessive smoking may obliterate the power of the formation of immune bodies just as surely as does excessive alcoholism.

Acute miliary tuberculosis does not react except in comparatively early stages of the disease, and if the first three doses do not cause a reaction there is no use of giving any further injections. The same thing may be said of tuberculous meningitis. I have seen a number of these cases and so far have not been able to elicit reactions in any one of them. Some of them have been children and some adults. There may be histological reasons for this though it would seem as if there should be reaction to the disease which undoubtedly exists in other parts of the body

—still the rule of no reaction no recovery holds good in these cases. There are, it is true, some cases of synovitis in which the reaction is satisfactory and the improvement exceedingly slow in proportion, due to the difficulty of penetration of wax lipases, but cases are rare in which the clearing up is not in keeping with the reaction.

As a diagnostic test mycoleum is more accurate than tuberculin and there is never a tolerance produced toward it as there is to tuberculin with evidences of the disease still present. Continued negative reactions at spaced intervals indicate that the disease has been eradicated or else is so thoroughly encapsulated that none of the antibodies can penetrate the encapsulated area.

The effect of the wax splitting enzymes often shows splendidly if samples of sputum are stained and compared at monthly intervals. A description of these changes deserves a separate chapter and will be treated at a later time but in general it may be said that there are several ways in which the phenomena may manifest themselves. There may be a peculiar irregular or moth eaten appearance of the tubercle bacillus as a whole where a portion of wax is eaten away, leaving the rest of the bacillus, or there may be a marked swelling of the whole bacillus with a hyaline appearance which takes the stain badly, or at a further stage of the process there may be a pale, yellowish structure with the characteristic shape and size of the bacillus but with little or no affinity for aniline dyes.

This last is evidently the membranous portion of the cell wall whose composition is at present unknown. These last structures often show a trace of pink color remaining and are the last bodies seen until the patient reports the absence of sputum.

Our experiences with mycoleum extend over twelve years and record many hundreds of cases of human beings and over a thousand experimental animals, beside those experiments done under the auspices of the U. S. Public Health Service.

We have administered several thousand doses during this period in every known form of the disease and have refrained from publishing these results until every important phase of the subject was completely covered and every side of the question thoroughly worked out. The following case reports have been selected to illustrate in general these forms. Nearly all of them were diagnosed by other physicians and referred to me for mycoleum treatment.

CASE I.—In 1908 a young lady (J. C.) was sent to me suffering with lupus of the face. Examination revealed similar areas on the chest, on the nasal mucous membranes, and on the scalp. There was evidence of an early choroiditis and the chest was pretty well scarred up. No particular area, just a diffuse fibrosis, corroborated by the x ray. She was aged twenty-three and gave a history of malnutrition from early childhood, was not underweight but her tissues had a corklike feel. I mention this because it is common in tuberculosis of the toxic or latent variety.

It is the scrofulous child grown up, carrying along with it all the early infection, all the intoxication, all the pathological changes caused by this

constant poisoning going on year after year, and yet because the patient is not emaciated or underweight we have to content ourselves with the unsatisfactory assertion that her tissues are bad, which does not give the picture in the slightest degree. The Wassermann was negative. I gave her a thorough course of tuberculin in the accepted way, with no improvement. Instead, she grew gradually worse until in 1913 I saw her in bed with a typical tuberculous enteritis of the typhoid type, an average daily temperature of 101° to 103° and a pulse of 120 to 130, which condition they told me had been going on for several months. I told the family that the prognosis was absolutely unfavorable, but they begged me to do what I could for her. I accordingly gave her full doses of mycoleum (three c. c.) at three week intervals for the first six doses and once a month thereafter until she had received thirty doses. She made a prompt and uninterrupted recovery and has remained well since. This case is reported to illustrate the effect on a patient long under observation and known to be slowly but surely going down hill with a fatal ending clearly in sight.

What has been said of other tuberculous conditions applies to eye cases also. In all instances the patient had been to a competent specialist and had received appropriate treatment from him or from some one familiar with tuberculin therapy and was finally turned over to me in the hope that mycoleum would prove of some value. We succeeded in obtaining favorable results in all of them and will briefly report a few selected at random from our records.

CASE II.—E. B., aged eighteen, ran a machine in a clothing factory. She was poor and mycoleum was expensive and scarce. She therefore took treatment only when driven to it by the ravages of the disease. She had iritis, episcleritis and corneal ulcers with intense photophobia. Every time she took a few doses, the condition improved to such an extent that she was able to work with comfort and the clinical signs rapidly cleared up. Every time she left off treatment, she remained well for about six months when the condition slowly began to return again, but the promptitude and completeness with which it always cleared up left no doubt in the mind of either patient or physician that mycoleum offered an absolutely reliable therapeutic weapon and left no doubt that the eye condition was progressive untreated. The Wassermann and gonococcic complement deviation tests were negative. The patient had been treated several years with tuberculin without improvement, and her condition had become so bad at the time of her first dose that there was every indication that she would have to have the eye removed, and she had been told that this would have to be done in a short time. She made a complete recovery with a perfectly useful eye. The time of treatment was from 1914 to 1916 and the number of doses sixteen in all.

CASE III.—Dr. G., aged forty-five, tuberculous iritis with intense photophobia confining him to a darkened room during the intermittent attacks. Three doses of mycoleum in 1914 and one in 1916.

No return of symptoms since that time and thinks the improvement entirely due to its action. There was no doubt about the diagnosis, as there were sclerocorneal ulcers containing tubercle bacilli.

Pharyngeal ulcers are of peculiar interest in that they are so spectacular. This case was Wassermann negative and had been diagnosed and treated with tuberculin very thoroughly without any great improvement.

CASE IV.—Mrs. A. O. T., aged thirty-five, married; husband tuberculous. First seen in 1911; condition was diagnosed as diphtheria by the attending physician and three doses of antitoxin were given without effect, except to produce such an erythema as to be rediagnosed by another physician as scarlet fever. Indeed the suddenness of the onset, the high fever and pulse and apparently well nourished condition made a tuberculous ulcer a remote consideration, but it persisted and continued to spread as weeks went on, and I saw her at a later date. Scrapings of the ulcer edges revealed the presence of tubercle bacilli, and later tubercle bacilli were obtained in the sputum coming presumably from the lungs, which showed distinct lesions. I wanted to give her mycoleum at once, but she looked upon it as an experiment, and as she had been sent to me for tuberculin treatment, I gave her tuberculin for a year with no results, as at the end of the year the ulcer was greatly increased in size and had involved the fauces and was so painful that she was unable to take any solid food. At this time she became discouraged and refused further treatment of any kind. I did not see her again for about five months, when things had become so bad that she could not even take liquids and her pulmonary lesions were rapidly increasing. She had lost weight, thirty or forty pounds, and her outlook was absolutely unfavorable. I gave her mycoleum and forced it at close intervals, giving her in all twelve doses. She made a complete recovery; the throat healed and at the end of six months she returned to her normal weight. I heard from her from time to time for several years, and when last heard from she was still in good health with no return of her tuberculosis. She finished mycoleum treatment in 1912 and reported as late as 1917.

CASE V.—C. D., aged thirteen, had suffered from cervical adenitis for five years, and already had several chains of glands removed by operation. They seemed to appear in crops first on one side and then on the other, but she was never free from them. She was given ten doses of mycoleum in 1914, and there were a number of small calcified nodules left which were removed the following year by a surgeon. I was told afterward that the appearance was retrogressive as far as the disease was concerned. The surgeon left drainage and was surprised to see the sinus heal immediately.

CASE VI.—M. F. had cervical adenitis, was treated with tuberculin without any particular benefit, and the Wassermann was negative. She was twelve when put on treatment and received twenty doses in 1913-1914. She had a very severe eczema over the whole body, which had been there since she was a baby, and which constantly increased in intensity.

This entirely cleared up by the time she was ready for discharge, and the cervical glands disappeared though they were never large. Her general health changed in a very noticeable manner. She was the typical sickly scrofulous child and belonged to a sickly scrofulous family. She suddenly shot up to womanhood and at fourteen was a patient to be proud of. She has remained well since.

Genitourinary tuberculosis without undue bladder contraction is a satisfactory form to treat. I have seen old chronic pulmonary cases drag their weary way along for months before any definite improvement could be seen. I have had desperate cases of general miliary tuberculosis give a definite clear reaction to mycoleum, indicating that they were still capable of being immunized, and then keep one guessing as to whether or not the positive reaction was a safe prediction of ultimate recovery. Yet a patient with genitourinary tuberculosis whose bladder must be emptied every hour or oftener, day and night, and who is utterly worn out from lack of sleep, suffering from pain and a constant desire to urinate, makes as already indicated an ideal one for the uninitiated to observe for the first time. Following the first dose in a local involvement of this kind, there is usually no setback. The patient simply makes a steady and uninterrupted recovery if he follows directions. The following report illustrates a failure to carry out our instructions on the part of the patient.

(To be concluded)

LONDON LETTER.

(From our own correspondent.)

Annual Lady Priestly Memorial Lecture.

LONDON, May 4, 1920.

Sir George Newman, chief medical officer of the Ministry of Health, delivered on April 22d, for the National Health Society, at Robert Barnes Hall, in the building of the Royal Society of Medicine, the annual Lady Priestly Memorial Lecture, which was instituted for the purpose of organizing annually a public lecture on whatever subject connected with public health might be considered most important at the time. No better man could have been found to deliver a lecture dealing with public health than Sir George Newman and his choice of subject, *The Place of Public Opinion in Preventive Medicine*, was peculiarly apt. He pointed out that some kind of public opinion, had no doubt existed from the earliest history of mankind. Sir Robert Peel defined that opinion as consisting of "a great compound of folly, weakness, prejudice, right feeling, obstinacy and newspaper paragraphs." That definition contained at least some ideas which were, perhaps, characteristic of public opinion today. Whether or not, the world was moved today, as never before, by the indefinable power of public opinion, governments, as well as national habit and custom, were impelled or moulded by the man in the street. He was master, the government was his servant. Referring to preventive medicine the

lecturer said that during the last half century, the increase of physiological and pathological knowledge, including that of infection, had been one of the outstanding features of the age. He now knew two certain facts about disease; first, that it is not something arbitrary, capricious, occult or accidental but is an effect of definite causes and conditions; secondly, that these causes and conditions are in a large and increasing measure controllable by man. Today, for the first time, public and personal health had become purchasable. There were two things we desired, health and long life, in other words, to reduce and if possible to abolish invalidism and physical disability and to postpone the event of death. It was to make human life better, larger, more capable and useful, happier, and to prolong our days.

The coming of the Ministry of Health meant a new sort of attack on the strongholds of disease. It meant, of course, increased intervention by the State, improved organization, central and local, a bolder policy. But there was a further factor in reform which was in some ways more important than all these, namely, an educated community and an enlightened public opinion. "As the science of government becomes more representative of the aspirations of the people as a whole, so also its practice becomes more dependent upon their education and equipment. Only an educated people is an effective and healthy people." The education required was not technical instruction in hygiene alone, but an informed humanism which welcomes and understands the growth of medicine and accepts its results boldly and gladly on behalf of all mankind. In the opinion of the lecturer England would not get much further in perfecting her national health organization until the average citizen has been educated to think, and to act as knowledge demands. This statement applies with equal force to America and all countries.

The elements of health for the body were nutrition, fresh air and exercise, and he pointed out that the food of the working classes in Great Britain was, generally speaking, unsuitable, unnutritious and badly cooked and served. The reason was not poverty, but lack of knowledge of the right food to buy and how to cook it. Emphasis was laid on the need for well ventilated factories, workshops and dwelling rooms. The great value of games and recreation was also dwelt upon. And with regard to games and recreation for women, the source of the new race, he said that if music and dancing, golf, hockey and tennis were good for any young woman they were good for all. Sir George proceeded to show how knowledge necessary for the maintenance of health and promotion of sound physique was equally necessary for the prevention of disease. Invalidism, disease and premature death were due to a relatively small number of morbid conditions. A large proportion of these diseases were directly preventable.

The chief hindrance in the practice of prevention was lack of knowledge on the part of the public. It was now known, for example, that four principal diseases, namely, pulmonary tuberculosis, influenza, poliomyelitis and cerebrospinal fever,

were conveyed from person to person by the inhalation of the causal microbe. Protection could be secured only by safeguarding one person from another on the individual scale. A clean mouth, clear breathing passages, abstinence from spitting, sneezing, coughing or shouting would go a long way toward the prevention of these diseases. The lecturer went on to show how considerably other groups of maladies, such as dyspepsia, septic wounds and diseases contracted by infection, infant mortality, etc., could be lessened by the dissemination of some simple knowledge as to their causation.

A further purpose of an enlightened public opinion in regard to preventive medicine was that the assent of the community might be won for sanitary reform and its consent secured for sanitary government, imperial and local. Hygiene could only become an expression of the national life if the people consented and were willing to advocate and carry out its reform. Mere legislation in this as in other fields would prove abortive if not supported by an intelligent public opinion. The lecturer recapitulated the principal items of a national policy in preventive medicine as follows: 1. Importance of rearing a healthy race. 2. Maternity and the care and encouragement of the function of motherhood. 3. Infant welfare. 4. The health and physique of the school child and adolescent. 5. Sanitation and an improved personal and domestic environment, including food, water supply and housing. 6. Industrial hygiene. 7. The prevention and treatment of infectious disease. 8. The prevention and treatment of noninfectious disease. 9. The education of the people in hygiene. 10. Research and the extension of knowledge.

In discussing the means of educating public opinion Sir George Newman dealt first with the young. What was needed was to give the child and adolescent population of all social classes and grades, first, a body of facts concerning personal health, and secondly, an experience in the practice of hygiene, the habit of healthy living. The two elements must be taught together and the subject pressed home every week in every school in the land. Arrangements must be made in all schools for physical training and instruction. To appeal to the youth and adolescent of the country, however, was not sufficient. We needed much wider methods of propaganda. We must avail ourselves of the services of all who know in behalf of all who do not know. All doctors, nurses, midwives, health visitors, sanitary inspectors and welfare workers should be missionaries of hygiene. The admirable work of the voluntary health societies could hardly be overestimated. Particularly valuable was such a campaign as that represented in national health work. Why not have a Health Day as well as an Empire Day or Hospital Day, as a regular feature of our national life? Again it was impossible to exaggerate the significance of the newspaper press as an educational health agency. The press had done much, but it might do more. It was after all the daily literature of the people. Lastly, the government itself could not be absolved from its share of responsibility in begetting a wise public opinion in health matters.

Editorial Notes and Comments

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CLINICAL FORMS AND TREATMENT OF BILIOUS HEMOGLOBINURIC FEVER.

There are two forms of bilious hemoglobinuric fever, each having a distinct symptomatology. The first, which breaks out at the time of a violent attack of malaria, commences with a severe chill. The temperature attains 103° to 105° F, accompanied by restlessness, occasionally by delirium, and attempts at vomiting. The urine is scanty and light red in color. There is a mild yellow tinge to the skin, the pulse is rapid but regular, the spleen hypertrophied, and the liver slightly enlarged.

In the second form of the process, which arises in chronic malarial patients when some secondary cause intervenes, there is no chill, the temperature never goes as high as in the first form of the process, while the restlessness and vomiting are absent. The urine, which is voided in large amount, is melanic, the tint of the skin is frankly icteric, and the pulse depressible. The heart sounds are diminished in clearness and the spleen and liver are hypertrophied. This is the more dangerous of the two forms because the patients have been weakened by long continued malaria, the cardiac muscle is wanting in tonicity, while the hemoglobinuria reaches its maximum degree from the onset.

The general treatment consists of an enema given at a temperature of 99° F. followed by a dose of sodium sulphate. This should be repeated every morning. In the first form twenty centigrams of sulphate or hydrochlorate of quinine should be injected at once and after this has been done the urine

should be collected at least every two hours and the tube containing the sample held against a sheet of white paper in order to appreciate the color. The red tint of the urine slowly decreases in intensity. The temperature is simultaneously taken with each urine examination and is compared with the successive notations of the colorimetric scale of the urine. The quinine injection should be repeated only when there is a drop in the temperature and a decrease in the intensity of the color of the urine. When the proper time has come, which may be delayed for eight, ten or even twelve hours, it is better to give two injections of ten centigrams each at one or two hour intervals than a single injection of twenty centigrams. When the temperature has become normal and the urine clear, the patient's condition should be followed and the heart especially watched.

In the second form of the process a very large dose of camphorated oil should be injected at the onset and the urine and temperature examined and compared, as stated above. The hemoglobinuria is, in this case, regarded as a secondary process by Houssian, and he believes that the cardiac disturbances are the all important feature of the condition. If they subside, the hemoglobinuria will have a tendency to disappear spontaneously. Diuretics are useless in this form and quinine will only activate the destruction of the red blood corpuscles. It is only later on, when the hemoglobinuria has become less intense, that quinine and arsenic may be exhibited to control the paludism.

THE ONTARIO MEDICAL ASSOCIATION.

On May 25, 1920, and the three following days, the annual meeting of the Ontario Medical Association convened in Toronto under the presidency of Dr. Fred W. Marlow. It is said to have been one of the most successful meetings in the history of the organization. Perhaps the direct contributory cause of this may be assigned to the rather extensive and ambitious efforts of recent years in the formation of county societies and district societies which, along with the city societies, have now representation on a body styled the Committee of General Purposes. This arrangement gives widespread and rather close connection with medical men in all parts of the province of Ontario—and where is the man who does not like to have a seat in the inner circle?

Immigration and alcohol were live topics. Regarding the former, the special committee on

legislation recommended that classes be established by school boards for the training of mentally defective children; that stringent immigration laws against bringing mental defectives into Canada be enacted; that there be legislation to prevent their marriage; and that students in medicine be more intensively educated in psychopathology. There are seven government vendors of liquor in Ontario—two in Toronto, and one each in Ottawa, Hamilton, Windsor, London and Kingston. It was the opinion that the number of these should be increased and that their offices should remain open on Saturday afternoons and Sundays. It was also suggested that doctors should refuse to write prescriptions for government vendors, as all such prescriptions should go to druggists. That the Ontario Temperance Act is a very unpopular measure was evidenced; and it is even so considered by the Government of the province itself, which has appointed a special committee of the legislature to inquire into the administration of the act. There is a growing feeling that not a quart but an eight ounce bottle should be the maximum for prescriptions.

President Marlow felt strongly that there should be some system for checking up the general practitioner. Particularly was he caustic in his remarks on the man who was too busy to take a few days off to attend the meeting of the provincial medical organization. This, however, was an old topic even before the president came into active propaganda work on this topic. Dr. Marlow's special designation of the shirkers was chronic fossils. It takes a long time to become a fossil, but what would an acute fossil be like? Dr. Marlow would give the Medical Council of Ontario power to expel, suspend, or order further courses of study where a practitioner was found incompetent. Consider what is ahead of one as an old man! The great lack of hospital accommodation and of professional nurses was another subject dealt with by Marlow. He thought that the extension of hospitals must be faced by the municipality in the future, and that there was a particular need for women trained as nurses and with a good knowledge of domestic science. His pronouncement on medical education against the six year course was wise, in that the student was stuffed and would be better for having opportunity for postgraduate study.

Dr. Charles W. Service, of West China, pressed upon the association the needs of the West China Medical School. In China lack of sanitation was the greatest problem. Mortality was probably forty to fifty to the thousand in adults and fifty to seventy to the thousand in children. The medical and surgical fields were enormous. He said that it

was intended to make the West China Medical School a Canadian institution.

A very interesting address was that of Dr. Ariel W. George, of Tufts Medical College, Boston. It was on the use of the x ray in the interpretation of symptoms referable to the biliary system, and was illustrated with lantern slides. Prof. N. W. Percy, of the University of Illinois, dealt with the subject of the transfusion of whole blood, which should be carried out only after careful selection of the donor. Its use in pernicious anemia occupied a good part of his address. Evidence was forthcoming that the high cost of living was affecting the medical practitioner in Ontario. Indeed, in some cities and towns fees have already been advanced from two dollars to three dollars a call and five dollars for emergency visits and visits after six o'clock p. m. Additional advance in fees for insurance examinations was a live topic, and larger fees for workman's compensation injuries were demanded. Dr. Gwyn, Toronto, in reading a paper on influenza, said that this disease generally came in three successive waves, that last fall witnessed the final wave and that Ontario was not likely to be visited again in the fall of 1920.

THE TREATMENT OF DYSPHAGIA IN TUBERCULOUS LARYNGITIDES.

Dysphagia is one of the most common symptoms of tuberculosis of the larynx, at least at the terminal phase of the process, and is one of the difficulties encountered in the care of those unfortunate patients who are unable to eat, and contributes toward making tuberculosis of the larynx one of the most distressing affections with which we have to deal. Its cause resides in the edema, or rather the infiltration of the upper structures of the larynx—epiglottis, arytenoids, and arytenoepiglottic folds, with or without ulceration.

The sensory nerve, whose territory corresponds with the laryngeal vestibulum, is exclusively the superior laryngeal which, before penetrating into the cavity of the larynx, passes very superficially between the lower border of the os hyoid and the upper border of the thyroid cartilage. If the examiner pushes the left side of the larynx with a finger of the right hand, the thumb of the same hand will distinctly feel the large horn of the hyoid, the horn of the thyroid and the free thyrohyoid space. A little stronger pressure over this area, especially on the diseased larynx, will at once give rise to rather sharp pain, shooting to the external auditory canal, on account of the superior laryngeal nerve being directly under the examiner's finger.

The dysphagia can be controlled in most cases by

regional anesthesia and the best procedure consists in pricking the nerve at the point where it underlies the skin, and injecting a few drops of eighty-five per cent. alcohol along the nerve. There is a sharp pain at first, extending to the ear, which proves that the injection has reached the proper structures. The pain lasts for but a few seconds and is followed by a complete analgesia and the entire disappearance of the dysphagia. The effect on both the mental state and the physical condition of the patient is naturally considerable. It is curious to note that the edema and infiltration diminish and the mucosa assumes its normal volume. On the other hand, the laryngeal lesions can be directly treated and the patient properly fed.

This anesthesia may last for several months following a single injection, in other subjects the amelioration is for only a few days, but it often happens that after six or seven injections a permanent anesthesia ensues. This treatment is practically devoid of danger, if the operator exercises a little care, and does not require any special technical knowledge other than the requisite amount of knowledge of regional anatomy which every practitioner should possess.

ILLINOIS AND HER SUBNORMAL CITIZENS.

"I am convinced that thousands of persons daily walk the streets of Chicago who, because of their mentality, are not fit to be at large. Should they be arrested for petty larceny they may be imprisoned two or three years, but imprisonment or psychological care will not create brains and a man cannot be always in prison in case he should commit some crime when released." J. L. Whitman, superintendent of prisons for Illinois, in saying this welcomes the new parole law of from two to five years for the subnormal prisoner.

Even with all that societies can do for these and for defective children they remain a care to the State, even a menace to society. At the end of 1919, Illinois alone had 19,194 cases classed under mental in her penal institutions.

Of course if they could always be kept imprisoned for fear of what they *might* do, matters would be more simple, but it is only when a paroled person feverishly and gustatorily commits some horrible crime that shocked normals concur in the advantages to be gained from institutional life run on a scientific and humane basis. But it will be costly, for beside those actually committed as subnormal, preventive work beginning, one might almost say, at a prenatal stage, must have more and more recognition. Illinois is now building a large graded prison offering opportunities by a progressive merit system, and the Department of Public Welfare is well staffed with clever men, but will leading citizens on its opening day give due reflection to the horrible necessity such a building suggests in any State?

FAMILY TREES.

There are many men in the United States who, when in America, will loudly proclaim their contempt for aristocrats, blue blood, and lordly castles, but such men are often found in the British Museum or the Royal College of Arms seeking to trace their family back to some denounced aristocrat or old county family in England.

When compiled such a document is of great interest to all relations, but names, dates, and titles do not enthuse the physician or the student of eugenics, who would gain more interesting facts from the family tree of Mark Twain, which had, as the owner remarked, only one branch (with a noose attached).

The Eugenics Record Office rather fancies such one branched trees; at any rate, it is offering four leaved ones to those who will follow instructions given and chart in four generations giving as much as possible concerning their character. The *Family Tree Folder*, when filled in, will be a complete modern eugenic record. It will give natural, physical, mental, and temperamental traits, so that their segregation and recombination may be traced in a definite manner.

News Items.

Yellow Fever in Vera Cruz.—A press dispatch from Vera Cruz states that several new cases of yellow fever have occurred there.

Irish Medical Meeting.—The annual meeting of the Irish Medical Association was held June 17th under the presidency of Dr. J. Marshall Day. Dr. E. Magennis was elected president.

United States Hospital No. 28 to Close.—Announcement has been made that U. S. General Hospital No. 28, at Fort Sheridan, Ill., will probably be closed on October 1st.

Dr. E. P. Lyon Honored.—Dr. E. P. Lyon, dean of the medical school of the University of Minnesota and formerly dean of the St. Louis University, has been awarded the honorary degree of LL. D. by the latter institution.

Dr. S. Josephine Baker Appointed.—Dr. S. Josephine Baker, director of the Bureau of Child Hygiene of the Department of Health of New York City, has been appointed consultant in child hygiene for the United States Public Health Service and has also received a commission as surgeon in reserve of the Public Health Service.

Plague Increasing in Southern Regions.—Reports of cases of bubonic plague continue to come in from Texas and Florida. Last advices were to the effect that eight cases have occurred in Austin, Tex., with three deaths; at Galveston there have been three cases of plague, with two deaths, and there have been four cases in Pensacola, Fla.

Health Bureaus Coordinated.—A coordination of the work of the U. S. Public Health Service and that of the Bureau of War Risk Insurance in caring for sick and disabled veterans of the war is shortly to be achieved by placing the two bureaus under the direction of one assistant secretary of the treasury.

Appointment of Dr. Benjamin White.—Dr. Benjamin White has been appointed director of the division of biological laboratories of the Massachusetts State Department of Public Health, to succeed Dr. Milton J. Rosenau, resigned.

Honor to Dr. Alonzo E. Taylor.—Dr. Alonzo E. Taylor, professor of physiological chemistry at the University of Pennsylvania, has been awarded the honorary degree of Doctor of Laws by the University of Wisconsin.

Brazilian Hospital Given to France.—The Brazilian hospital installed during the war at Vaugirard, France, at a cost of ten million francs, has been offered by the Brazilian government to the French faculty of medicine. Although the hospital will serve for the study of general medicine and surgery, it will be used more particularly for teaching practical surgery to Brazilian medical students in Paris.

United States Civil Service.—The United States Civil Service Commission announces examinations on October 1st for the following positions: Medical intern, St. Elizabeth's Hospital, \$1,200 a year and maintenance; bacteriologist, U. S. Public Health Service, \$130 to \$180 a month; assistant bacteriologist, \$70 to \$90 a month; junior bacteriologist, \$70 a month; junior bacteriologist, part time \$30 to \$50 a month.

New York State Civil Service.—The Civil Service Commission of the State of New York announces examinations on July 31st for the following positions of interest to medical men: Assistant medical examiner, State Industrial Commission (write for special circular); physician and assistant physician, state institutions, \$1,500 to \$1,800 and maintenance; physician (psychiatrist), Syracuse State School for Mental Defectives, \$2,000 and maintenance.

Appointments and Promotions at the Rockefeller Institute.—The board of scientific directors of the Rockefeller Institute for Medical Research announces the election of Dr. Winthrop J. V. Osterhout as a member of the board to succeed Dr. Theodore C. Janeway, deceased.

The following promotions and appointments are announced: Dr. Alfred E. Cohn, hitherto an associate member in medicine, has been made a member. Dr. Peyton Rous, hitherto an associate member in pathology and bacteriology, has been made a member. Dr. Donald D. Van Slyke, hitherto an associate member in chemistry, has been made a member. Dr. Francis G. Blake, hitherto an associate in medicine, has been made an associate member. Dr. John H. Northrup, hitherto, an associate in experimental biology, has been made an associate member. Dr. James H. Austin, hitherto an assistant in medicine, has been made an associate. Dr. Harry W. Graybill, hitherto an assistant in the department of animal pathology, has been made an associate. Dr. William C. Stadie, hitherto an assistant in medicine, has been made an associate.

The following have been made assistants: Miss Helen L. Fales (chemistry), Dr. Philip D. McMaster (pathology and bacteriology), and Miss Marion L. Orcutt (animal pathology).

The following new appointments are announced:

Dr. Harry Clark, associate member in pathology and bacteriology; Dr. Pierre L. du Nouy, associate member in experimental surgery; Dr. Paul H. de Kruif, associate in pathology and bacteriology; Dr. Lloyd D. Felton, associate in pathology and bacteriology; Dr. Rudolph W. Glaser, associate in the department of animal pathology; Dr. Carl A. L. Binger, assistant in medicine; Dr. Ralph H. Boots, assistant in medicine; Dr. Louis A. Mikeska, assistant in chemistry; Dr. Charles P. Miller, Jr., assistant in medicine; Dr. Eugene V. Powell, assistant in x ray; Dr. Leslie T. Webster, assistant in pathology and bacteriology; Dr. Goronwy O. Broun, fellow in pathology and bacteriology; Miss Katharine M. Dougherty, fellow in pathology and bacteriology; Dr. André L. E. Gratia, fellow in pathology and bacteriology; Mr. Thomas J. Le Blanc, fellow in pathology and bacteriology; Dr. Giovanni Martinaglia, fellow in the department of animal pathology; Mr. Henry S. Simms, fellow in chemistry.

Dr. Marshall A. Barber, hitherto an associate in pathology and bacteriology, has accepted a position with the U. S. Public Health Service to do field work in the Malaria Research Laboratory, Memphis, Tenn. Miss Angelia M. Courtney, hitherto an associate in chemistry, has accepted an appointment to do chemical research work in the Medical School of the University of Toronto. Dr. Carl Ten Broeck, hitherto an associate in the department of animal pathology, has accepted an appointment as associate professor of bacteriology, with the Peking Union Medical College. Mr. Earl P. Clark, hitherto an assistant in chemistry, has accepted a position with the Bureau of Standards, Washington, D. C. Dr. Ferdinand H. Haessler, hitherto an assistant in pathology and bacteriology, has accepted an appointment as resident pathologist in the department for nervous and mental diseases in the Pennsylvania Hospital at Philadelphia. Dr. Arthur B. Lyon, hitherto an assistant in medicine, has resigned to enter private practice.

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DIED.

BROWN.—In Boston, Mass., Dr. Frank Byron Brown, aged fifty-seven years.

CARPENTER.—In Pottsville, Pa., on Sunday, July 4th, Dr. James Stratton Carpenter, aged sixty-one years.

CONKLIN.—In New York, N. Y., on Monday, July 5th, Dr. Fanny Donovan Conklin, aged seventy-four years.

COPE.—In Nazareth, Pa., on Sunday, June 27th, Dr. Thomas Cope, aged seventy-three years.

CURTIS.—In New Britain, Conn., on Saturday, June 26th, Dr. John Henry Curtis, aged fifty-six years.

GRAY.—In New York, N. Y., on Saturday, July 3rd, Col. William W. Gray, aged sixty-nine years.

HOLDRIDGE.—In New York, N. Y., on Saturday, July 3rd, Dr. Walter Henry Holdridge, aged forty years.

KELLOGG.—In Sacramento, Cal., on Tuesday, June 22nd, Dr. Donald A. Kellogg, aged fifty-five years.

LANE.—In Philadelphia, Pa., on Wednesday, July 7th, Dr. Peter Henry Lane, aged forty-one years.

PAUSON.—In San Francisco, Cal., on Tuesday, June 29th, Dr. Charles Arthur Pauson, aged thirty-eight years.

SCOFIELD.—In Dalton, Mass., on Tuesday, July 6th, Dr. Walter W. Scofield, aged sixty-six years.

THOMPSON.—In Snohomish, Wash., on Sunday, June 20th, Dr. Thomas F. Thompson, aged seventy-one years.

Book Reviews

THE SIN OF WEAKNESS.

Peter Middleton. By HENRY K. MARKS. Boston: Richard G. Badger (The Gorham Press), 1919. Pp. v-370.

There have been novelists of the past who intuitively and unconsciously used the tools of psychoanalysis to represent their characters more truly than the superficial observer would appraise them. The writers of the present with a conscious appreciation of psychoanalytical investigation have usually handled the subject rather clumsily. Here, however, is a writer who has revealed the unconscious side of his hero's character with the clearness, the interpretation, the convincingness of a technical psychoanalyst, and yet no awkward, inartistic tool work is visible.

One wonders whether, as such truer representation of human lives becomes more common, literature will have to substitute some other name than hero for the chief character of a story. Literature has gradually descended from gods to demigods, from demigods to heroes, and now to what? Will it not be a truer, more helpful revelation of a weak and struggling fellow man, and the reason for success and failure? As the field of knowledge regarding ourselves and others is thus enlarged we shall lose nothing of a genuine appreciation of human nature and be better able to develop a genuine heroism which meets successfully the actualities of loving and living.

Peter Middleton was sufficient for neither of these. He did not know what it was to discover and realize himself, he did not know what was expected of a genuine masculine self. He cherished a lovely idealism, a temperamental, dreamy appreciation of beauty. He called it artistic but it had none of the true artist's strong creative tendency. It was rather an escape from healthy activity upon external things and deeper still from a recognition of inner unyielding fountains of power. The repellant austerity of his mother must have early driven those deeply within and fixed them for Peter where they were incapable of being tapped. At least only a woman in later life who comes first as a wiser mother, deeper in tender creative wish and yet with an ability to become the equal adult companion, succeeds in awakening any healthy outward reaction on the part of Peter. That, however, was too late for him to escape the bonds which his weaknesses had woven about him so that the abject failure of his life could not be stayed.

Until it was too late Peter had never learned what it was psychologically and physically to be a man. His idealism was not only a substituted escape from the sterner facts of reality, it actually also turned him back to feed upon himself. There is no escape from the results of a morbid absorption in self except through an outgoing relation to the external world. Peter could sustain such a relationship only for a brief time and in an incomplete ineffectual way. The products of introversion are self pity, of which Peter bore a heavy load, shameful inadequacy in confronting insincerely aggressive types of men, spinelessness and indecision in the face of the clinging affection and desires of another, which form his

final entanglements and lead to his complete undoing.

The author discloses with an artistic suggestiveness and reserve the fundamental disturbance in the hero's nature. He was radically ineffectual because the sexual fountain of power and interest in life was blocked and distorted from its true development. He was psychologically and physically incapable of giving to his first wife the love which her more healthy nature demanded. His imagined love for her was only a phantasied ideal as unreal as his dreamy enjoyment of all external beauty. His relation to his second wife was only the helpless reaction of a man utterly incapable of thinking or acting for himself, too ignorant of either his rights or his duties to avoid the marriage or to make something workable out of it once he had entered into the relationship. His attempts to set things right as well as he can are as infantile as all his actions. His clumsy, unsophisticated method of releasing his first wife from her marriage bonds brings upon him a seemingly undeserved nemesis in the venereal infection which later reappears twice in horrible form, first to mark another attempted sexual outbreak and then finally to ruin his second married life and precipitate his end. He has to learn that the race is not to the weak.

The book is a strong and fearless study of the inner nature of a man whose conscious ideals and good intentions could never have furnished explanation for his cumulative failure. Deeper study was necessary. The writer has multiplied the details of this failure somewhat unnecessarily. This seems to be a temptation to the modern analytical type of novelist. It will doubtless be easier in time to handle the vast field of unconscious motives more simply as readers and writers grow better acquainted with its features and mechanisms.

Physicians will recognize the clearcut clinical pictures of the symptoms of syphilis. As an object lesson in the dangers of venereal disease it is one of the most graphic stories that has ever been told. While it serves as a vehicle to convey the horrors and far-reaching effects of disease and portrays with clarity the follies and weaknesses of men and the webs of their own weaving into which they fall, it does not lose its artistic value at any part of the story.

HEREDITY AND ENVIRONMENT.

Heredity and Environment in the Development of Man. By EDWIN GRANT CONKLIN, Professor of Biology in Princeton University. Second Printing of Revised Third Edition. Illustrated. Princeton, N. J.: Princeton University Press; London: Humphrey Milford (Oxford University Press), 1920. Pp. xv-361.

A third edition of Conklin's lectures delivered at the Northwestern and Princeton universities presents the subject of the biology of the human race with its chief theme of heredity in a form enlarged and revised according to recent advance. This is an advance not only in biological investigation, affording therefore a wider and surer basis for the study of heredity and development, but represents also a growing and broadening interest in these problems. The latter is due in part to the growing

recognition of the interrelation of structure and function, upon which the writer lays emphasis. It rests also upon present greater surety in regard to the problems of heredity and its fundamental facts with realization of their importance in the understanding of the evolution and development of both mind and body. This means a possibility of control of man's development toward a better future physically and in all the departments of his psychic life. The author maintains throughout his discussions such an all embracing view reaching back through all development as well as forward through the present responsibility toward future improvement. He recognizes the unalterableness of heredity, the fixity of its principles and facts, and at the same time the influence in the unfolding of the race or of each individual in response to the stimuli of the environment.

He seeks to present practically and clearly the sociological implications of these facts, to present the dynamic relation of structure and function, as well as to make plain the facts of biology upon which all this rests as far as these facts have been discovered. He enters, therefore, with a simplicity and definiteness which make the book of practical value to every reader, into the subject of the factors and stages of development of the body, particularly of the germ cells, and of the mind in its parallel growth and development. Particular space is given to the discussion of heredity as it depends on these elementary facts of development and as it in itself forms a basis for all further development and conscious social effort toward improvement. The book is profusely illustrated by figures taken from the experimental work on germ cells and of human and other forms of life.

MODERN METHODS OF ANESTHESIA.

Handbook of Anesthetics. By J. STUART ROSS, M. B., Ch. B., F. R. C. S. E. With an Introduction by H. ALEXIS THOMSON, C. M. G., M. D., F. R. C. S. E., and Chapters upon Local and Spinal Anesthesia, by WILLIAM QUARRY WOOD, M. D., F. R. C. S. E., and upon Intratracheal Anesthesia, by H. TORRANCE THOMSON, M. D., F. R. C. S. E. Edinburgh: E. & S. Livingstone; New York: William Wood & Co., 1919. Pp. 214.

"This little book," says Ross in his preface, "is an attempt to present to the student and practitioner a condensed account of modern anesthetic views and practice." Let it be said at once that the attempt has been eminently successful. The first four chapters are devoted to the factors that modify the physiology of the patient during an operation under a general anesthetic. The author has very wisely refrained from describing in detail the technic of administering the volatile anesthetics and has limited himself to a consideration of the underlying principles. Throughout the volume emphasis has been laid on the relations of anesthesia to general medical science rather than upon elaborate descriptions of anesthetic apparatus which a few years hence may be superseded. The account of the use of nitrous oxide and oxygen is deservedly full, for a just appreciation of this mixture was arrived at through the experiences of the war. Gas and oxygen are the safest of all general anesthetics and for major operations should be preceded by a hypodermic injection of morphine

and atropine. During the latter part of the induction stage, it is well, especially for the tyro, to give a trace of ether vapor and to maintain it until the operation is well under way. Gas oxygen anesthesia is indicated in minor operations lasting five to fifteen minutes, particularly if performed on out patients; operations of any variety upon the subjects of severe shock; the removal of tonsils and adenoids, and may be employed as an adjuvant to gas or gas and oxygen and as a help to the speedy induction of closed ether. The discussion of the accidents and sequelæ of anesthesia is brief, lurid, helpful. In the chapter on choice of anesthetics Ross points out that the selection of the drug and the method depend on the age, sex, physical type, and temperament of the patient, the possible presence of some definite pathological lesion, and the nature and duration of the operation. Each of these factors is expounded so clearly that the selection of the proper anesthetic ought to be relatively easy. The chapter on local anesthesia was written by William Quarry Wood. "The section dealing with regional anesthesia will prove especially valuable to the surgeon. The chapter on spinal anesthesia, also contributed by Wood, leaves nothing to be desired. No one who has read this very valuable little volume can fail to agree with Alexis Thomson, who writes the introduction: "I feel on perfectly safe ground in recommending this book as . . . a reliable manual of instruction . . . to both the student and the practitioner."

THE SUPERJOURNALIST.

Woman Triumphant. By V. B. IBANEZ. Translated from the Spanish by HAYWARD KENISTON. With a Special Introductory Note by the Author. New York: E. P. Dutton and Company, 1920. Pp. v-322.

This novel has gone into fifteen editions in two months. That is its outstanding feature, and to one who does not take fifteen editions too seriously the fact is suggestive. It is singularly appropriate to Señor Ibanez's largeness of gesture, his fertility, the muscularity of his books. Any smaller circulation for such an expansive piece of writing would be like condemning a sunflower to a hotbed. We are glad the reading public has a sense of the fitness of things.

In telling this story the author invests with an air of romantic improbability events which are not entirely improbable. His main character is a figure greatly like himself—healthy, frank, theatrical, and objectively minded—a sort of superjournalist in painting. Mariano is deflected from artistic sincerity by his wife, who will neither allow herself to be painted nude nor permit her husband to use models. Ibanez does not quite dare to say that prudery and evasiveness are fatal to good painting of any kind, whether of the human body or of a collection of fruit. Paul Gauguin, who left his sympathetic, respectable wife to go to the South Sea Islands and paint, was aware of this truth. But Mariano Renovales does not do anything so indecorous. Instead he devotes himself to his wife, paints portraits of fashionable ladies with plenty of clothing, and earns a great deal of money. And most of the portraits are bad—Ibanez at least admits that.

Josephina, the wife, is left an invalid by the birth of a daughter, and the ugliness of ill health embitters both her life and that of Mariano. It is not surprising that the painter enters upon an affair with a woman as healthy as himself and that Josephina, discovering it, grows more hostile and bitter and ugly, finally dying of accumulated resentment. Here is where Señor Ibanez falls back upon one of those dexterous twists of the wrists which account for the fifteen editions. The Countess of Alberca, coming to reproach Mariano for his neglect, finds him "in love with his wife—and after she was dead! Shut up like a hermit in order to paint her with a beauty which she never had." "It is the wife who triumphs," comments our author in his preface, "resurrecting in spirit to exert an overwhelming influence over the life of a man who wished to live without her. . . . Renovales, the hero, is simply the personification of human desire, this poor desire which, in reality, does not know what it wants, eternally fickle and unsatisfied."

To Ibanez this character may be the personification of human desire, but to the reviewer he is a horrible example of what happens to those who temporize. Mariano sacrifices his art first to romantic love and second, when that love has vanished, to a sense of duty, and when he does break away it is not toward freedom but only to a hectic relationship with an indiscriminate woman. The outcome is the only possible one: Mariano at the end of his career is alone, his talent fading, and all that he has left is the delusion that he has always loved his wife and that she has always loved him! A more ironic situation could not be imagined, but the trouble is that Ibanez has taken it with entire seriousness as regards the external events and with a total want of psychological understanding. He has neither the sensuality of Mr. Robert W. Chambers nor the sentimental morality of Mr. Harold Bell Wright and he is less insular than either, yet he stands on the same plane. He writes astonishingly: the story is unfolded with an overflowing amplitude; the author has a detailed and dramatic knowledge of many sorts of human beings, and a seemingly endless store of energy with which to write about them. Nevertheless, his observation is essentially that of the journalist—alive to dramatic possibilities and the pageantry and color of life, recording itself with facility, and not concerned with what lies beneath the surface. He might in fact be called the superjournalist.

ADVENTURES IN SOUTH AMERICA.

The Purple Land. By W. H. HUDSON. Author of *Green Mansions*, etc. With an introductory note by THEODORE ROOSEVELT. New York: E. P. Dutton and Company, 1916. Pp. v-355.

The modern man, though he may now travel under or above the land, has little time to travel back to satisfy his curiosity concerning the beginnings of civilization and still less to dream of the possibilities of natural wealth in countries still not wholly known. What, then, should be known of the romance, the customs, the manners of those who inhabit them? Any encyclopedia will tell him that "The Purple Land" (Banda Oriental) was discovered by Magellan in 1500; and in 1515, Juan

Diaz da Solis, while searching for passage into the Great South Sea, entered the Rio de la Plata; that in 1535 Buenos Aires was founded, a city which, in conjunction with its own colony, Montevideo, virtually monopolized the history of a region equal in extent to Western Europe. It remains for the gentle but determined adventurer, the scientist, the novelist, and the poet to entrance our restlessness with the real story of a country.

So one is glad that W. H. Hudson gives us "The narrative of one Richard Lamb's Adventures in the Banda Oriental," glad that his book, first issued in 1885, has seen a new edition, for the disappointed stay-at-home traveler, the naturalist, and those who love stories of hairbreadth escapes, will find satisfaction and delight in sharing Richard Lamb's journey of perils and astonishments and learn with him the curious unwritten legends and stories in which the people delight. Those who know something of this vast country will recognize many places he mentions and the true portraiture he gives; those who hardly hope to go ajourneying will have their imagination so stimulated that pale thought will almost seem vital reality, even as it happened to the low salaried clerk, who at holiday time bought a railway guide and spent a few hours at a crowded London terminus. Imagination furnished the rest of the vacation.

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

WHISPERS. By LOUIS DODGE. New York: Charles Scribner's Sons, 1920. Pp. i-261.

WARD TALES. By E. C. DAVIES, V. A. D. New York and London: John Lane Company, 1920. Pp. i-211.

JOAN OF THE ISLAND. By RALPH HENRY BARBOUR and H. P. HOLT. Boston: Small, Maynard & Co. Pp. i-292.

THE WHITE MOLL. By FRANK L. PACKARD, Author of *From Now On*, *The Night Operator*, etc. New York: G. H. Doran & Co. Pp. v-306.

PROCEEDINGS OF THE MEDICAL CONFERENCE HELD AT THE INVITATION OF THE COMMITTEE OF RED CROSS SOCIETIES, Cannes, France, April 1 to 11, 1919. Illustrated. Geneva, Switzerland: The League of Red Cross Societies, 1919. Pp. vi-179.

FEDERAL INCOME TAX. War Profits and Excess Profits. Taxes. Including Stamp Taxes, Capital Stock Tax, Tax on Employment of Child Labor. By GEORGE E. HOLMES of the New York Bar. Illustration. Indianapolis: The Bobbs-Merrill Co., 1920. Pp. xv-1151.

THE BEST PSYCHIC STORIES. Edited, with a Preface by JOSEPH LEWIS FRENCH, Editor of *Great Ghost Stories*, *Masterpieces of Mystery*, etc. Introduction by DOROTHY SCARBOROUGH, Ph.D., Lecturer in English, Columbia University. Author of *The Supernatural in English Literature*, *From a Southern Porch*, etc. New York: Boni & Liveright. Pp. xv-299.

A DICTIONARY OF TREATMENT INCLUDING MEDICAL AND SURGICAL THERAPEUTICS. By SIR WILLIAM WHITLA, M.A., M.D., LL.D., M.P., Late Professor of Materia Medica and Therapeutics in Queen's University, Belfast, Consulting Physician to Royal Victoria, Belfast Ophthalmic and the Ulster Hospitals for Women and Children. Sixth Edition. Chicago: Chicago Medical Book Company, 1920. Pp. viii-1083.

Miscellany from Home and Foreign Journals

Thyroid Feeding Action on the Pancreas.—Hirotohi Hoshimoto (*Endocrinology*, January-March, 1920) says that nine normal male and five normal, nonpregnant female white rats were fed for several weeks on bread and milk. The diastase content of the pancreas varied (Wohlgemuth's method) from 25,000 to 35,000 units in males and 16,700 to 50,000 in females. The average for both sexes was 24,717. Feeding dry thyroid in doses of 0.5 to 0.1 gm. resulted in a marked decrease of the diastatic activity of the pancreas varying from forty to ninety-two per cent. This was accompanied by a diminution of the acidophile granules of the pancreas cells. Large doses of thyroid were more effective than small, but the effects in different animals were variable. The diastase content of the intestinal juice was also decreased in some cases by the thyroid. In such positive cases the appetite was markedly depressed and the feces were soft; in extreme cases they contained considerable quantities of fat. Thyroid feeding frequently resulted also in marked enlargement of the pancreas. In such cases the pancreatic diastase was often decreased even when the amount of food consumed and the intestinal diastase were augmented. The decrease cannot be ascribed to general metabolic perturbation since it frequently antedated any evidence of such: it is rather ascribed to stimulation of diastase discharge from the pancreas.

Intestinal Parasites in Filipino Children.—F. G. Haughwout and F. S. Horrilleno (*Philippine Journal of Science*, January, 1920) studied 100 sick Filipino children with regard to intestinal parasitism. Ninety-two per cent. were found infested with one or more parasites. Under one year the incidence was 66.6 per cent., and between the first and second years, 73.6 per cent. All the children between two and thirteen years were found parasitized. No protozoön of proved pathogenicity was, however, encountered in the series. It is suggested that an apparent immunity of children to forms such as *Entamoeba histolytica* and *Balantidium* may have a physiological basis in the child. The incidence of infection with *Spirochæta eurygyrata* was high—sixty-one per cent. The authors' experience coincides with that of other workers who have failed to record any definite train of symptoms attributable to intestinal parasites other than those that are specifically pathogenic. Concomitant infestation with *Trichuris* and *Ascaris*, however, is accompanied by an almost characteristic train of symptoms referable to the digestive tract. Combination of these two helminths is especially serious, the entire alimentary tract being involved. Children occasionally purge themselves of *Ascaris* infections, particularly if complicated by *Trichuris* infection, through vomiting or defecation of the worms, or both. Helminthal infections were restricted to the nematodes. Respiratory diseases other than tuberculosis, influenza, and pleurisy were met in thirty-three per cent. of the children studied. The lung stages of *Ascaris* may be responsible for much of the respiratory disease

among Filipino children. Hookworm infection was found in twelve per cent. of the series; only one severe case was recorded. Sanitary conditions are a heavy factor in the infection of children, but the weak link lies in the failure to educate mothers in the principles of domestic hygiene. A given city may be clean to educated people but insanitary with respect to the child. Campaigns through the schools, visiting nurses, and physicians should be instituted. Parasitism starts coincidentally with bottle or artificial feeding and even breast fed children do not escape in all cases. Intestinal parasitism contributes heavily toward the high death rate of young Filipino children. *Endolimax nana* and *Dientamoeba fragilis* are reported for the first time from the Philippine Islands. *Eutrichomastix* is provisionally reported.

Surgery of the Chest.—Berkeley Moynihan (*British Journal of Surgery*, April, 1920) gave the results of his experiences as follows: Forty-nine cases were treated by operation; two patients died, one from hemorrhage following the removal of a projectile from the root of the lung, and one from sepsis after the removal of an infected foreign body and a piece of clothing. The late history has been obtained in forty-three cases. Twenty-four patients are, they say, in perfect health, and are able to do heavy work. Fourteen of these patients are better than before operation, but still have some shortness of breath, or unusual respiratory trouble when having a cold, or in bad weather. Some are a little better since the operation. Two patients died; three are unable to do any work, or have serious respiratory trouble, shortness of breath, cough, etc. All but five were operated on by the ordinary anterior method. The five operated on by direct attack from behind show four with good ultimate results, one with fair result. Eighteen of the foreign bodies were examined bacteriologically; eleven were infected with *Staphylococcus aureus*, or *Streptococcus brevis* in equal numbers, or by these organisms together with coliform bacilli; seven were sterile. Empyema after operation developed in five cases, and in each of these, when the foreign body was examined, it was found to be infected. In twelve cases blood collected after operation in sufficient quantity to require aspiration. In all these the adhesions were dense, and were widely separated. These twelve include the five reported above in which empyema subsequently developed. Of the seven which did not suppurate, only once was the foreign body examined, and it was sterile. In ten cases the original injury had been followed by empyema. The only effect this had at the time of removing the foreign body was that adhesions were found to be very dense and extensive. Three cases were reported as having had hemothorax at the time of the original injury; at the operation for removing the foreign body, adhesions were dense; in two of these three cases an exceedingly thick blanketlike membrane had to be removed by scissors to allow the expansion of the lung.

Intussusception in Typhoid Fever.—A. L. Moreton (*British Journal of Surgery*, April, 1920) came to the following conclusions:

1. Acute intussusception is one of the rare abdominal complications of typhoid fever.

2. It may occur at any time during the progress of the disease, but usually late or during a relapse.

3. It may be caused by irregular peristalsis due to inflammatory changes in the wall of the gut, or an enlarged Peyer's patch may start the process of intussusception.

4. The intussusception is more commonly of the enterocolic type. If of the enteric type, there may be more than one lesion.

5. The differential diagnosis from perforation may be difficult.

6. The prognosis is good if the patient is submitted to operation, and the results of operative treatment are better than those of perforation.

7. In reducing the intussusception at operation, it should be borne in mind that diseased bowel is being dealt with, and that the utmost gentleness should be used in all manipulations.

Protein Sensitization in Bronchial Asthma and Hay Fever.—Charles N. Hensell (*Minnesota Medicine*, April, 1920) states that foreign proteins may enter the body chiefly through three different channels, i. e., inhalation, ingestion, and infection. In the inhalation type there are four sources, namely, 1, animal hair and dandruff; 2, pollens; 3, flour, and 4, dust. In the ingestion type there is but one source, namely, food. The chief food offenders in order of importance are, 1, cereals, such as wheat, corn, rice, rye; 2, eggs; 3, fish, such as lobster, salmon, mackerel, and cod; 4, casein; 5, beef; 6, chicken; 7, cocoa. Walker's proportion of the various causative factors is twenty per cent. sensitive to horse dandruff, fifteen per cent. to wheat, fifteen per cent. to staphylococcus pyogenes aureus, fifteen per cent. to early pollens, ten per cent. to late pollens, five per cent. to cat hair, three per cent. to staphylococcus pyogenes albus, and seventeen per cent. to miscellaneous proteins.

Distant Foci of Infection in Chronic Arthritis.—Herbert S. Chapman (*Annals of Surgery*, May, 1920) states that fifty per cent. of the cases of chronic arthritis treated at the Stanford University clinics by the removal of foci of infection, according to clinical observation, showed definite improvement. From personal observation of twenty-one cases, the following was concluded: Seventy-six and two tenths per cent. of the cases showed no definite improvement or change; four and eight tenths per cent. were worse after treatment. Although the proportion of improvement did not vary greatly in the different groups, the most striking results were obtained in those cases in which the focus was situated in the genitourinary tract. Long continued faithful treatment is necessary before improvement can be expected in the cases in which the focus is located in the genitourinary tract. Very rapid recovery with very few treatments was obtained in those cases in which the teeth were the seat of infection. Removal of the tonsils in several cases was followed in a few days by loss of pain, and later by return of function to the injured joint.

Pseudomyxoma Peritonei.—M. H. Biggs (*Annals of Surgery*, May, 1920) states that pseudomyxoma peritonei is much more frequent than is generally recognized. It is caused by cellular implantation. It is histologically benign, but may be clinically malignant. If it is considered to be a form of cancer, it must be assumed that pseudomucin inhibits its destructive power. It may originate in the ovary or the intestinal tract; ovarian origin being by far the most frequent. If it is appendiceal in origin, the appendix has been the seat of chronic inflammation. Early invasion of the peritoneum is characterized by a pebbly appearance. In early cases the condition will sometimes be cured, and at any stage it may be inhibited, by operation.

Operative Treatment of Vesicovaginal Fistulæ.—E. S. Judd (*Surgery, Gynecology and Obstetrics*, May, 1920) concludes as follows:

1. Vesicovaginal fistulæ are now more common following operations than following childbirth.

2. All vesicovaginal fistulæ should be considered operable as long as the sphincter muscle of the bladder is intact or can be repaired. If the sphincter has been completely destroyed it will be necessary to consider some other procedure.

3. Suprapubic extraperitoneal operations seem to be indicated if the cystoscopic examination reveals injury to a ureter as well as to the bladder, or it may be indicated if the fistulous tract is adherent to the pubic bone.

4. The plastic vaginal operation consists in completely separating the bladder from the vagina, and closing the two separately and obliterating all dead space.

5. A large proportion of complete and permanent cures follow such operations.

Suprapubic Prostatectomy.—J. W. Thomson Walker (*British Journal of Surgery*, April, 1920) in discussing prostatectomy presented the following findings in the operation he describes:

1. Two objections may be raised to this operation. It requires a longer incision than the usual prostatectomy, and more time is required for its performance.

2. The longer incision suggests the possibility of a hernia of the scar; but hernia depends upon the ability of the surgeon to repair the abdominal wall and to keep the wound clean.

3. The incision should heal up to the tube channel by first intention. With efficient repair of the abdominal wall, a hernia need not be feared.

4. The length of time spent on the operation from start to finish is about thirty minutes, and there is no increase in the shock after the operation. Shock in prostatectomy is partly due to hemorrhage and partly to rough handling in enucleation. Both of these causes can be avoided.

5. An unexpected feature of the open method is the absence of a great part of the spasmodic pain after operation. This pain, which lasts for twenty-four or forty-eight hours, is due partly to the large tube, but mostly to the accumulation of clots in the bladder, with consequent spasm of the bladder muscle in the attempt to expel them. The latter factor is abolished where the bleeding can be efficiently combated.

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Original Communications

AN EFFORT TO STANDARDIZE SURGICAL MENSURATION.*

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Many different methods have been suggested for making measurements for both military and civilian clinical records, and it is with a desire of obtaining a standardization of these that the present paper is concerned, as well as to encourage recording by a simple method. In the majority of hospitals, no measured record of affected bones and joints is kept. In these hospitals the only instruments for routine anthropometric record are usually the tape-measure, the x ray and possibly the photographic camera. In a small number of hospitals, chiefly orthopedic, an endless number of devices are to be found, many inaccurate and unscientific, for measuring the range of motion or angle in joints. It can almost literally be said that no two of them use the same appliance for recording motion and each has a different apparatus for each joint in the body.

It is conceded that for the most thorough work, full bedside clinical records should be detailed on the chart, not only to give data as to the condition of a patient when first seen, but also to note progress under treatment and the end result. In the standardization of hospitals, proposed by the American College of Surgeons, full clinical records are insisted on.

It is advisable that any device adopted for recording motion should be of universal application to all joints to render use general, and not require one for each joint. The device should be simple in construction, inexpensive, and easy to use, so that the readings of different individuals should give minimum variations in the hands of the different observers, and thus the personal equation be eliminated, as far as possible.

RECORDS REQUIRED.

Three and possibly four comparative records are required in the involved and uninvolved extremities and joints on the two sides, viz: a, length of extremities; b, circumference of extremities; c, motion of each joint; d, position of angle of malposition in ankylosis or partial ankylosis. In the spine, deviations in an anteroposterior or lateral direction and

limitation of motion in the different regions are to be recorded as to extent. The amount of rotation in scoliosis, as to degrees, is necessary for record.

It is essential for accuracy that a fixed position of the body be maintained for immediate and future observations. This can only be attained when the body is supine or prone, centred on a horizontal examining table with the extremities symmetrically placed, unless the disability itself prevents, except in pronation and supination of the forearm and motions at carpus metacarpophalangeal and interphalangeal joints. In a standing attitude a patient may consciously and intentionally or unconsciously tilt or lean forward, backward, sideways or in a twisted position and no records at stated intervals should be made thus with any idea of accuracy.

APPARATUS REQUIRED.

1. Table. An ordinary horizontal rectangular wooden top examining table, six feet, six inches long and three feet wide with legs three feet high is necessary. The centre of this table at top and bottom is marked with a thumb tack. An imaginary line joining these will constitute what we may call our base line. In the region that will correspond with the location of shoulder and hips of patients to be measured, two lines are ruled on each side parallel with the table's edge, and, of course, with the base line and three inches apart. These we speak of as parallel lines. (See Figure 1).

We know from geometry that when a line crosses two parallel lines, the alternate interior angles are equal and any line at right angles to the first line crossing the parallel lines produces also alternate interior equal angles. (See Figures 2 and 3).

Therefore, any angle made by an extremity in relation to the base line or upon which we have the axis of the patient's body or a joint resting, is identical with that angle obtained from the table's edge or any line parallel to it, when the patient is properly centred. Take for example, adduction of the humerus. (See Figure 4). AB equals the line of axis of humerus. The angles BGH and BFD are not measurable as the patient is lying on them, but the angle ECA (or BCJ) is identical and equal to them, easily sighted and accessible. (See Figure 4). It would be manifestly incorrect to put any instrument on top of the rounded shoulder or hip, and expect to obtain an accurate reading. These readings, however, from the parallel lines are readily made by a graduated semicircle and protractor.

*Published by permission of the Surgeon General, U. S. Army.

2. The semicircle with a protractor at its centre made in our orthopedic shop at Fort McHenry is graduated in degrees to measure the range of motion. This is made of aluminum, and has two forklike legs, which may be attached, if it is desired to use it vertically, as well as horizontally without them.

3. The ordinary cotton spring tape measure. This is preferable to the steel tape measure, as will be

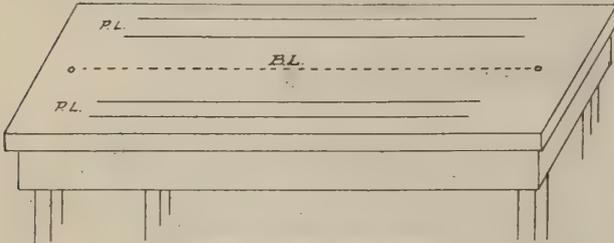


FIG. 1.—Examining Table

seen under measurement of circumference. (Figure 5).

4. The lead tape consists of a strip of sheet lead three mm. thick, two cm. wide and one metre long, and is to be molded over curves and used then as a ruler to trace these data on the history. (Figure 6).

5. A rectangular drawing triangle.

6. A yard stick.

STANDARD POSITIONS OF PATIENTS TO BE MEASURED.

In order that all subsequent measurements may be comparative, it is essential that a standard position be agreed upon in which all individuals are measured and as in all upright positions, inclination of the trunk in relation to itself or to the extremities are likely to vary, the position in recumbency becomes the natural standard. The centre of the table in the region of the head and the heels is used as the guide in placing the patient in the supine or prone position. The arms are to be at the sides, fully extended, and the forearms in neither pronation nor supination, and the fingers fully extended.

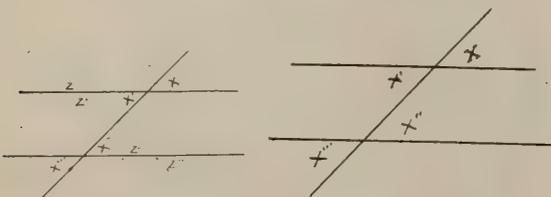


FIG. 2. FIG. 3.

Geometric figures used as a basis for making the records.

The line joining the anterior superior spines of the patient must be at right angles with the base line. The legs are fully extended with the toes pointed vertically upward, and the heels equally distant from the central base line.

For records of spinal deviation or knee flexion, the patient is similarly to be centred in the prone position. The recording angle of rotation in scoliosis is demonstrated by yard stick and graduated

semicircle and protractor. Figure 6 shows the recording angular deformity in Pott's disease by the lead tape, which is to be used as a ruler in tracing curve on the history. Figure 7 shows method of recording flexion of knee. A method is demonstrated of measuring by means of yardstick and

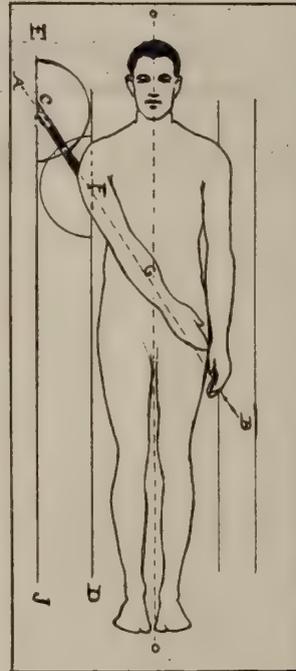


FIG. 4.

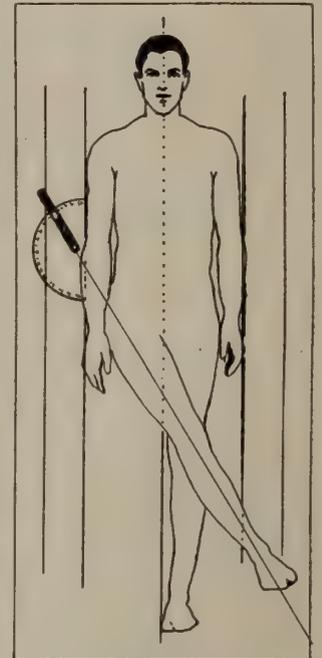


FIG. 5.

The readings are determined by the parallel lines made by a graduated semicircle and protractor.

rectangular triangle amount of deviation of spine from base line in lateral curvature. For records of pronation and supination of the arm and flexion of the metacarpophalangeal joints and wrist, the patient sits beside the table with the entire forearm supported. (See Figure 8). For tests of flexion of terminal phalanges or second joints



FIG. 6.—The lead tape being molded over curves.

the palm surface of the hand is placed on the table up to the joint and the reading made.

LANDMARKS.

The following landmarks are, as a rule, easily and accurately located in all individuals in order to

measure length of bones: 1, Suprasternal notch; 2, tip of the xiphoid cartilage; 3, symphysis pubis; 4, anterior superior spines; 5, anterior tibial tubercles; 6, malleoli; 7, acromion processes; 8, olecranon processes; 9, styloid processes of the ulnæ; 10, vertebra prominens; 11, posterior superior spines; 12,



FIG. 7.—Method for recording flexion of the knee.

ischial tuberosities; 13, greater trochanters, and 14, gluteal notch.

When the patient is in position, 1, 2 and 3 are on the base line, and the line joining the two anterior superior spines should be at right angles to the base line. The distance from the anterior superior spine to the internal malleolus on each side gives the comparative measurement of the two legs. If one is found shorter than the other, and it is desired to determine the bone at fault, this may be done by measuring from the anterior superior spine to the anterior tibial tubercle and from there to the malleolus on each side.

Similarly the arms may be measured from the acromion processes to the styloid processes of the ulnæ, and to and from the olecranons.

The anterior superior spine, the greater trochanter and the ischial tuberosity are normally on Nelaton's line. Departure of the trochanter from this line indicates dislocation or fracture or bending of the femoral neck of so much displacement, depending on the amount of this departure. This is an accepted measurement for record.

The vertebra prominens, the spine and the gluteal notch in the normal prone individual constitute a straight line parallel to our base line. Departures laterally to one or the other or both sides consti-

tute a lateral curvature, and backward or forward, an anteroposterior curvature, and must be measured as must be rotations or twists in the spine in the cervical, dorsal or lumbar regions. (See Figure 6).

COMPARATIVE MEASUREMENT OF LENGTH OF LIMBS.

After accurately marking the landmarks needed with ink or skin pencil, it is quite easy to measure the lengths desired. It is better not to press the scale of the tape measure on the skin, as the latter is likely to slip, but simply place the scale lightly on the parts and make the reading.

Major Robert D. Maddox, M. C., U. S. Army, suggested that the tape be stretched tight beyond the two points, with the figure 10 at the first point and the number noted at the other fixed point, when the reading could be recorded less 10. This would obviate error from undue or unequal stretching of the tape or slipping of the skin.

COMPARATIVE MEASUREMENT OF CIRCUMFERENCE OF LIMBS.

It can easily be appreciated that owing to the conical shape of limbs, circumferential measurements must vary considerably, if made at different levels; it is essential, therefore, that identical points be chosen on the two limbs for comparison, and these points should be marked with ink or skin pencil at a measured distance below a fixed bony landmark. Thus in the thighs the points chosen should be a



FIG. 8.—Method of securing readings of wrist flexion with entire forearm supported.

given number of inches or cms. below the anterior superior spines; in the calves, below the anterior tibial tubercles; in the arms, below the acromions; and in the forearms, below the olecranons. Major Maddox also suggested that in order to get even tension on the tape that the free end be held in one hand, then the part be encircled and the tape case

be allowed to fall vertically as a plumb bob. The number 10 is used as the first point, and where the tape passes the 10 after encircling, is read and recorded less 10.

MEASUREMENT OF ANGLES OF POSITION OR RANGE OF MOTION IN JOINTS.

The desire to record these observations on charts has led in private practice and hospitals, where a



FIG. 9.—Method of recording dorsal flexion at the ankle joint.

sincere effort has been made to keep accurate progress charts, to an endless number of complicated and expensive appliances. Many records were inaccurate, owing to the necessity of application to the patient when the latter was in what might be termed an unstable position, or one in which from time to time, or one may even say from one minute to the next, variations in readings might be observed with proportionate errors. It is therefore essential to accuracy that the positions described above be insisted on, and all measurements of angles be made with relation to the base line or one of its parallel lines on the horizontal table.

It is further important that all readings of the position of extremities or their components be made from a zero position, i. e., neither flexed nor extended, rotated in nor out, pronated or supinated, etc. It is necessary for this basis to be agreed on in comparing results in different clinics. For example, it is manifestly confusing for an author to speak of flexion of the elbow of 70° , when he means 110° , that is, starting from zero or full extension. Similarly semipronation should be pronation of 90° , or supination of 90° .

It is therefore patent, I believe, that the method herewith introduced is accurate to all intents and purposes, sound, practical and simple, and may be applied to all the joints with but slight, if any, different findings, if obtained by different observers. This we have proved to our satisfaction by testing the findings of several assistants seriatim and comparing the very negligible error.

Figure 5 shows the recording of adduction of the hip joint, and Figure 9, recording dorsal flexion at the ankle joint.

1102 NORTH CHARLES STREET.

DIAGNOSTIC TESTS IN HAY FEVER AND ASTHMA.

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As the immunizing methods of treating hay fever and hay fever asthma are becoming recognized as the most practical means of controlling these diseases, it is important that accurate methods be employed in order to obtain successful results.

GEOGRAPHICAL DISTRIBUTION.

In the majority of diseases, such as smallpox, diphtheria and tuberculosis, the causative factor is a pathogenic microorganism, which is the same regardless of the geographical distribution of the disease. In hay fever, however, in spite of the apparent similarity of the symptoms, the cause is a pollen which varies materially in different locations. In Europe, for instance, the cause of hay fever is the pollen of the grasses, Gramineæ, to the exclusion of the ragweed (Ambrosiaceæ) group. In the United States, however, while the grass pollen is the most common cause of spring hay fever (sometimes erroneously called rose cold), the pollens of the ragweed group form the principal cause of fall



FIG. 1.—The grasses, Gramineæ group, form the principal cause of spring summer hay fever in Europe and most sections of the United States. The illustration shows the following grasses: Meadow, redtop, timothy, perennial rye, orchard, foxtail and Johnson.

hay fever (1). In view of this, it is important, before commencing immunizing methods, to determine the incriminating pollens; or, what is usually sufficient and more practical, the group to which biologically the pollen belongs.

BIOLOGICAL GROUPS.

From the viewpoint of immunization, we have divided the principal hay fever pollens into four groups, which include eighty-five per cent. of all hay fever pollens. These groups are as follows (2):

1. Gramineæ (Fig. 1). All species and families



FIG. 2.—Marsh elder, *Iva ciliata*, belonging to the ragweed (Ambrosiaceæ) group. Found in moist soil, Illinois to Nebraska, south to Louisiana and New Mexico.

of the grasses, including the cultivated varieties (cereals).

2. Ambrosiaceæ (Fig. 2). This includes the various varieties of ragweeds, Ambrosias, cockle burs, *Xanthium*, marsh elders, *Iva*, and false ragweeds, *Gærtnerias*.

3. Artemisias (Fig. 3). The wormwoods, of which there are about sixty species in the western parts of North America, and which are important factors in hay fever in the Pacific and Rocky Mountain States.

4. Chenopodiaceæ (Fig. 4). This group includes the chenopods, docks, *Rumex*, amaranths, *Amaranthus*, and Russian thistle, *Salsola pestifer* and *glauca*, which, although botanically not as closely related as the three other groups, are similar in their hay fever reaction.

In the application of pollen therapy, the extracts of the pollens of any one of these groups are interchangeable, and may be used singly, or a combination of several, for testing and immunizing methods. As an indication of the more scientific methods in the treatment of hay fever demanded by the medical profession, the majority of the biological houses now prepare these pollen extracts of single pollens,

or of the same biological group, instead of the shotgun method formerly in vogue, in which many kinds of pollen, and belonging to different biological groups, as the grasses and ragweeds, were used, and recommended for immunizing purposes.

ATMOSPHERIC POLLENS.

An important feature, which seems not yet well recognized, is the fact that hay fever is due to atmospheric pollens, and that only these are needed for testing and immunizing purposes (3). We are still receiving frequent inquiries regarding such plants as clover, daisies, golden rod, oleanders and jasmines, as a cause of hay fever, and these are still referred to as furnishing hay fever pollens, in otherwise excellent articles published in the medical journals. The persistence of placing blame on the golden rod is especially remarkable, in view of the well known fact that the most brilliant bloom of the golden rod, *Solidago canadensis*, is in October, when practically all of the hay fever attacks have subsided by the end of September (4).

DIAGNOSTIC TESTS.

In making the diagnostic test for hay fever, we are guided, in the selection of the pollen extract, by the location. It is therefore necessary to know the hay fever plants to which the patient is exposed, the representative biological group being sufficient in most cases. East of the hundredth meridian, we



FIG. 3.—Wormwood sage, *Artemisia frigida*, artemisia group. On dry plains and on rocky soil, Minnesota to Saskatchewan, Yukon, Idaho, Nebraska, Texas and Arizona.

must test for the grasses, ragweeds and chenopods. West of this meridian, the tests should in addition include the artemisias. The ragweed test should also be made in the Rocky Mountain and Pacific

States, since, although the ragweeds are uncommon, there are other members of the ragweed or Ambrosiaceæ group, such as the gærtnerias, marsh elders, Iva, and cockle burs, which respond to the same test and similar immunizing methods.

In making the diagnostic test, we have standard-



FIG. 4.—Curly dock, *Rumex crispus*, Chenopodiaceæ group. Found throughout the United States and Southern British America.

ized the method, which, in a series of over a thousand cases, has given us results which are accurate as regards the nature and degree of the sensitization, and reliable as a guide to the immunizing doses. Five units of the extract of the selected pollen, of the strength of one hundred units to the c.c., are injected into the skin, and the reaction determined



FIG. 5.—False wormwood, *Parthenium hysterophorus*. From southern Pennsylvania to Illinois, Missouri, Florida and Texas, and throughout tropical America. In warm climates, the parthenium blooms every month, and is a minor cause of perennial hay fever.

in twenty minutes, and recorded on a percentage basis. A marked wheal, two or more centimetres in diameter, is recorded as one hundred per cent., one centimetre fifty per cent., etc. While this is

an arbitrary scale, it is valuable for gauging the size of the dose and for purposes of comparison, and is much more definite than such terms as mild, marked or severe.

TESTS AS A GUIDE TO DOSE.

The record of the diagnostic test is placed at the head of the clinical chart for each patient, so as to form a constant guide in administering the immunizing doses. A mild reaction indicates a proportionate tolerance of the pollen extract, and a marked reaction that caution should be used in increasing the doses of the pollen extracts. In one of our patients, whose test is registered ninety-five per cent., the limit of his dose is one hundred and seventy-five units of ragweed pollen extract. As soon as this dose is exceeded, a miliary eruption develops and sometimes a typical hay fever reaction.

The record of the test also indicates the probable maximum dose required for desensitization. In patients of ninety per cent. reaction or over, two hundred units is the maximum dose, and should be reached by gradually increasing doses. In those



FIG. 6.—Flowers (florescence) of marsh elder, showing enormous pollen production of wind pollinated plants.

marked sixty per cent. the maximum dose is six hundred units, and others in proportion (5).

TESTS FOR PATHOGENIC GROUPS.

In our last series of cases, in addition to the tests for sensitization to the various groups of pollens to which the patient is exposed, we include the test for a vaccine composed of the following microorganisms: *Bacillus Friedlander*, *Micrococcus cattarrhalis*, pneumococcus, *Streptococcus pyogenes*, *Staphylococcus aureus* and *albus*. If there is a marked reaction to the intradermal injection of this vaccine, it is used as a part of the immunizing process, and the degree of the reaction, as in the case of the pollen extracts, forms a guide to the size of the injections.

IMPORTANCE OF ACCURATE TESTS.

We believe that the relatively high degree of success in the treatment of hay fever in our hay fever clinic at the Charity Hospital (6) is due to the fact that each case is individualized, and a course of treatment followed that is based on the character

and degree of the diagnostic test, and regulated by the records of the atmospheric pollen plates and the reaction of the patient. To inject large doses of extract in order to immunize a patient, when he is already absorbing the protein of numerous atmospheric pollens, tends to develop an anaphylactic shock that explains many failures in the treatment of these cases.

Naturally, this is avoided if the immunizing is commenced before the attack is due. Unfortunately, however, the majority of patients apply for treatment only when they are already suffering from hay fever. This complication requires much greater delicacy in the application of the treatment; but, unless due attention is given to these details, the results will be discouraging to the physician and disappointing to his patient.

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A REPORT OF SOME INTERESTING CASES OF PROTEIN SENSITIZATION.

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CASE I.—A. J., female, aged thirty-six, married. Family history: Father has chronic asthma, otherwise negative. Previous history: Has had several attacks similar to present illness, lasting two to three weeks. Present history: The attack began four days ago with severe pain in the right eye. The eye became very red. Examination established the diagnosis of a definite scleritis of an unknown etiology. Patient had been taking salicylates and colchicum without any relief. A protein test was performed and a positive three plus reaction to white of egg was obtained. The patient was instructed to abstain from taking white of egg in any form; all other medication was discontinued. Three days later she returned feeling perfectly well. There was no pain and the eye was absolutely normal.

I believe this to be a true case of protein sensibility in view of the previous history in which we note the long duration of previous attacks, the lack of relief under large doses of salicylates and the rapid improvement after removal of a protein which gave a definite skin reaction. I have tested three other cases of scleritis giving positive skin tests and recovering rapidly after removal of the offending protein.

CASE II.—Female, aged twenty-seven; family

history and previous history negative. Present history: The difficulty began eight days ago with itching and burning of right eye, profuse lachrymation, marked photophobia and intense redness of palpebral and ocular conjunctiva. The patient had been receiving local treatment for the eye without apparent relief. A protein test performed on the ninth day of her illness showed a positive reaction to mustard, wheat and crab, of which the patient had partaken freely for several days preceding the present attack. The diagnosis was an acute conjunctivitis of anaphylactic origin. On removal of the offending proteins the conjunctivitis rapidly subsided and within three days the eye was absolutely normal.

CASE III.—L. H., female, aged forty. Family history, negative. During the past few years the patient had had repeated attacks of sudden decided swelling of lips and tongue during or immediately following a meal. Examination showed the lower lip, gums, tongue and soft palate to be markedly swollen and edematous. A diagnosis of angioneurotic edema was made. The protein test showed a very marked reaction to white of egg. The reaction measured two cm. in diameter. The patient was desensitized against white of egg and can now take one egg a day without symptoms appearing.

CASE IV.—B. McG., aged seven. Had had severe attacks of bronchial asthma for two years, especially severe during the summer months. The family history was negative; physical examination, negative. The protein test showed a positive reaction to potato, white of egg and rabbit hair. The patient had two rabbits in the house. Removal of the potato and white of egg from the diet and removal of the rabbits resulted in a complete recovery in several days. The patient has not had an attack of asthma in seven months and skin tests with potato, egg white and rabbit hair are now negative.

CASE V.—L. K., aged ten. Had had asthma for two years with persistent cough and expectoration. Physical examination showed the presence of a chronic bronchitis. The protein test gave a positive reaction to banana, potato and chicken. Also positive to parrot feathers, *Staphylococcus aureus* and slightly positive to goose feathers. The offending proteins were removed from the diet, the parrot was disposed of and a suitable *Staphylococcus aureus* vaccine injected by Dr. L. B. MacKenzie, who referred this patient for protein examination. The patient has made a complete recovery and is now absolutely free from asthmatic symptoms.

CASE VI.—A. B., aged forty-seven. Persistent asthmatic attacks every night for past six years; could not lie in bed at night; free of symptoms during the day. Protein tests showed a strongly positive reaction to goose feathers. Patient has been free of all symptoms since the substitution of a hair pillow, and is sleeping comfortably in bed all night.

CASE VII.—J. V., aged seven. Complained of repeated attacks of severe epigastric pain. Pain came on three to four hours after eating and lasted for about thirty minutes. Duration of present illness about six months. The previous history was

negative; the physical examination was negative. Gastric analysis showed free hydrochloric acid, 40; total, 70; blood negative. X ray examination showed a decided pylorospasm. Negative for ulcer of stomach, colon and pathological gallbladder condition. Protein test showed a strongly positive reaction to whole egg. All egg was removed from diet and patient has only had an occasional attack of pain since day of testing, four months ago.

I believe these occasional attacks were due to the presence of some egg in his food. Skin test four months later still gave a slightly positive reaction. I have seen four cases of pylorospasm with moderate increase in gastric acidity of definite anaphylactic origin in which the spasm completely disappeared on removal of the offending protein. Two of these cases were in children under ten, and the other two in adults over twenty.

CASE VIII.—Rev. H. G., aged twenty-seven. Severe dermatitis extending over both hands and arms. Family history, mother has had hay fever for twenty years. Previous history, hay fever coming on about August 20th for past six years. Had never had a skin eruption before present illness, and never had hay fever, except after middle of August. The present illness began two weeks ago (May 5, 1919), with burning and itching of both hands and arms and the appearance of the eruption, which was characteristic of dermatitis, followed in two days by an attack of hay fever. The protein tests gave a negative reaction to all the common foods, bacteria and animal emanations, but gave a four plus to ragweed and three plus to timothy, and two plus to sunflower. Believing that the dermatitis was due to timothy sensitization, and it already being the timothy pollen season, I advised this patient to go on a sea trip, as it was too late to obtain beneficial results from active immunization. A few days after leaving on this sea voyage the dermatitis disappeared completely. The patient returned to me in June for immunization against ragweed and sunflower, free from all signs of the previous attack of dermatitis.

2 WEST EIGHTY-EIGHTH STREET.

PEPTIC ULCER.

Clinically and Röntgenologically Considered.

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(Concluded from page 91)

Mobility and flexibility.—The supporting anchorage of the stomach are the esophagus and the gastrophrenic ligament at the cardiac region and the duodenohepatic ligament about one inch beyond the pylorus. Between these parts the body of the stomach has considerable range of movement and by palpation can be lifted or shifted to either side. It moves with respiration. By forcibly contracting the abdominal muscles it can be drawn upward distorting its outline. If the abdomen is relaxed the gastric walls are flexible and can be indented on palpation.

Gastric secretions.—In the normal stomach the fasting secretions are negligible and cannot ordinarily be seen unless under pathological conditions.

Peristalsis.—Considerable attention has been devoted to gastric peristalsis. The ringlike contraction waves passing over the stomach at definite intervals represents its physiological motor phenomenon of churning of the food and its expulsion into the duodenum. Viewed fluoroscopically we notice an initial contraction, soon after the introduction of the meal, best seen after a sediment mixture consisting of barium and water. This appears as an indentation on the lesser curvature in the vestibule just below the incisura angularis. Simultaneously there appears a corresponding wave at the greater curvature. These are of short duration. If the full meal is now administered, there occurs a delay of from about five to ten minutes during which time no peristaltic contractions are seen, due to the sudden distention of the muscular walls. Soon, however, the regular peristaltic contraction sets in. A shallow wave first appears on the greater curvature below the level of the incisura cardiaca in the pars media. A wave similarly shallow but even less perceptible is seen on the lesser curvature. They travel down gathering but little in depth until they reach a point just beyond the incisura angularis, when the waves suddenly increase in depth, the contractions producing the maximum indentations in the vestibule or antrum pylori, from whence they travel sharply toward the pylorus. At times the depth of the wave is so intense that the stomach appears to be divided into two parts. This has aroused considerable discussion in the past as there was believed to exist a sphincter antri separating the stomach into two compartments. By the animal experimentations of Cannon and the bioröntgenographic studies of Rieder, Kaestle, and Rosenthal, it has been definitely proved that there is no cleavage of the stomach. Cannon explains these augmented contractions as the necessary requisite for the churning and chymification of the food. The energy of the wave varies with the type of stomach, being greatest in the hypertonic and orthotonic stomachs and less in the subtonic types. It is influenced by the deep respiratory movements and by abdominal massage and is greater in the prone and oblique postures. The waves succeed each other at regular intervals, the traversing of each wave throughout the entire length of the stomach consumes about twenty-two seconds and is spoken of by Cole as a gastric cycle. Several waves are often seen simultaneously and are spoken of as the one, two, three, or four cycle stomach.

Motility.—It is an established fact that the röntgenological examination offers conclusive evidence of gastric motility. The findings in a given case are taken as a definite index of the power of the stomach to empty itself within normal or abnormal limits. When a definite standard of meal is used, the carbohydrate (Rieder) meal or its modifications, it has been found that the longest time for a normal stomach to empty itself is six hours. The steer-horn stomach empties sooner, between two and a half to three hours. The orthotonic type empties between four and five hours and for the subtonic

types six hours are allotted. In the Haudeck hubhöhe or the Satterlee and Le Wald water trap stomachs, which are nothing but markedly exaggerated subtonic stomachs with the acute incisura angularis, the pylorus rising sharply upward, a longer time than six hours is required. Eight hours may still be considered normal. If it exceeds this period we must regard the condition as pathological. Carmen and Miller in a series of 950 cases at the Mayo clinic, which were examined by means of both the röntgen rays and the test meal, and went to operations, state: "Our own series indicates the six hour bariumized carbohydrate meal is a more sensitive test of gastric motility than the method

tion and depth. According to location we may consider: 1, Ulcers on or about the lesser curvature (on the posterior and anterior walls approximating the lesser curvature); 2, pyloric ulcers in the prepyloric region; 3, ulcers situated at the cardia. Classified according to depth: 1, Mucous or simple ulcers involving the superficial layers; 2, penetrating or callous ulcers, when the ulcer is of long standing and has ulcerated into the deeper strata of the muscular walls producing deep craters, spoken of also as saddle ulcers when overriding the lesser curvature; 3, perforating ulcer, the ulcer extending outside the stomach walls beyond the visceral coat forming at times an accessory pocket in the surrounding tissue.

The röntgen methods of diagnosis of gastric ulcer are as follows: 1, Direct method, which consists of the visualization of the niche, accessory pockets and pyloric craters; 2, indirect method, consisting of secondary or contributory signs indicating the departure from the normal morphology and from the normal physiological function, plus the appearance of adventitious signs which give expression to the disturbed functions.

DIRECT SIGNS.

Penetrating ulcer (Haudeck niche), Fig. 1, on the lesser curvature is seen as a forward projection from the contour of the stomach appearing as if it were a diverticulum filled with barium. It is best seen when situated above the incisura angularis. It varies in size and shape; usually rounded in outline, it may assume any irregular form. The size varies according to the depth of the penetration, from a few mm. to an inch or more. When on the posterior or anterior wall it is best seen when using the sediment mixture. At times it may be completely missed when the buttermilk mixture is at once administered. I have had many opportunities to verify this and use the sediment mixture to good advantage. All positions must be utilized, especially both obliques.

2. The perforating ulcer with the accessory pocket shows the diverticulum with a supervening layer of air simulating a miniature stomach pouch. Here the base of the ulcer has gradually perforated through the visceral layer of the peritoneum into the neighboring organs such as the pancreas or liver, becoming firmly adherent. The niche with the accessory air pocket is often seen after the stomach has completely emptied itself. A niche must be differentiated from a filled loop of small intestine, usually the duodenojejunal junction jutting above the gastric line; also from an apparent elevation on the gastric walls intervening between two closely following peristaltic waves. Both of these waves, while persisting for a time, are not constant. The differentiation will be made fluoroscopically.

3. Callous ulcer of the pylorus when occurring close to the pyloric sphincter gives the appearance of a filling defect and not as a projection. When of long standing it may simulate an early carcinoma defect. Fig. 8 illustrates the persistent filling defect of a callous ulcer about half an inch away from the pyloric sphincter as seen in the multigraph exposure. The case was one of extreme interest. It occurred



FIG. 1.—Large penetrating ulcer on the lesser curvature. The deep forward projection from the lesser curvature simulating a diverticulum shown.

used by the gastroenterologist." The röntgen ray showed approximately seventy per cent. more retention in pathological cases than the clinical methods of extraction about fourteen hours after a Riegel meal and raisins partaken the night before.

In taking up the röntgen interpretation of peptic ulcer we shall consider them in the two main classifications: Gastric and duodenal ulcers.

Gastric ulcer.—The accuracy of the röntgen diagnosis of gastric ulcer today cannot be overemphasized. Carman and Miller state: "From our statistics we can say that nine tenths of the ulcers of the stomach give distinct röntgenological indications of gastric disease, and in an overwhelming majority of these the signs are either pathognomonic or strongly presumptive."

Gastric ulcers may be classified according to loca-

in a young woman about twenty-eight years of age with gastric symptoms of rather short duration, in whom a fairly large tender mass was felt extending downward toward the right iliac region. The clinical diagnosis was that of a possible hypernephroma. The röntgenological examination at once



FIG. 2.—Organic hourglass stomach of several years' duration following penetrating ulcer of the lesser curvature. Large doses of belladonna left condition unchanged.

made the diagnosis of callous ulcer of the pylorus with pyloric stenosis. Operation corroborated the diagnosis. The mass which was nothing but a large inflammatory exudate disappeared shortly after the gastroenterostomy operation.

INDIRECT METHOD.

The secondary or contributory manifestations of gastric ulcer will be more easily understood if we consider the same phenomena governing the normal stomach, such as the type, tonus, outline, motility and peristalsis, and how they are influenced in the pathological states. In addition several new factors make their appearance—the so-called spastic manifestations.

Hyperacidity and hypersecretion are the main functional disturbances in ulcer. A study of the röntgenological appearance of these functional changes and of their influence upon the stomach constitutes the indirect method of interpretation. These changes are differently expressed, depending upon the location of the ulcer and the underlying type of stomach. In speaking of the normal stomach, stress was laid upon the relation of the morphology of the stomach to the status of the individual. In diseased conditions, however, the relation becomes disturbed so that an individual normally the possessor of a subtonic stomach may have a hypertonic stomach, and vice versa. The alterations

in form are due to changes in the tone of the musculature of the stomach in response to the stimulus of an existing lesion. The changes thus wrought will vary with the location and duration of the ulcer. There may also occur alterations in size, capacity and position, the stomach rising higher within the abdomen or descending lower. Similarly there may occur disturbances in the motor phenomena, as seen by the changes in the peristalsis and motility of the stomach. Changes in outline are likewise encountered, resulting from increased muscular irritability, which distort the contour diffusely or specifically. These functional changes in outline are spoken of as spasm, and the stomach may assume either the hourglass form or may be diffusely distorted. Organic changes arising from connective tissue infiltrations around ulcer areas will cause adhesions and will anchor the stomach in abnormal shapes and positions, such as is seen in the snail form, or organic hourglass (Fig. 2). Pressure from without, such as gas in the splenic colon, enlarged spleen, and tumors may likewise produce distortion in outline.

Tone.—In gastric ulcer loss of tone is the rule. When situated at the lesser curvature the hypotonic or stretched out fishhook type is invariably encountered. In the administration of the meal, while there may be a temporary delay at the site of the ulcer, it soon, however, is seen to drop into the lower gastric pole, which appears distended and sagging. In pyloric ulcer with long continued obstruction the loss of tone is considerable and all the muscle fibres are stretched out, the stomach appearing uniformly enlarged, taking on the appearance of ectasia. The upper as well as the lower gastric pole and pylorus are uniformly widened.

Peristalsis.—Altered peristalsis is not an outstanding feature of ulcer situated in the pars media. Pyloric ulcers, however, when associated with various degrees of stenosis, exhibit an increase in depth and number of the waves. The waves rise abnormally high and bite deep into the lumen of the stomach, often giving the appearance of three or four segmented round balls. Later on when ectasia has occurred from the continued weakening of the musculature, the peristaltic contractions are intermittent, with long intervening periods of atony, the contents lying dormant in the basinlike low stomach. When strongly stimulated by abdominal massage the stomach will suddenly stiffen up and be thrown into a violent convulsive standing contraction which may last but a moment and then suddenly relax into the previous ectatic atonicity.

Spastic manifestation.—The visualization of the inherent characteristics of the gastric musculature to undergo spastic or standing contractions when subjected to irritations from within, or reflexly from without, only became apparent when the röntgen ray was first used in examinations of diseases of the alimentary tract. The finding of a spastic contraction is of great value and cannot be disputed even by those who base their information on direct findings alone, for a spastic contraction will often denote the presence of ulcer in the ab-

sence of any other evidence. All parts of the digestive tract are subjected to spasm, the stomach, however, is the ground where manifestations of insult from within or from distal abdominal viscera most frequently make themselves felt.

Spasm in gastric ulcer may assume the following forms, dependent upon location and general characteristics: 1, The incisura or spastic hourglass; 2, diffuse or general gastrospasm; 3, spasm of the pylorus.

1. The incisura is due to a contraction of the circular muscle fibres occurring in the plane of the ulcer. It is manifested by a narrow, smooth, and regular indentation of the greater curvature. It varies in depth and width, depending upon the size of the ulcer. They are usually seen in the pars media in the vertical portion of the stomach, but may occur anywhere. When deep enough it may bisect the stomach into two sacs giving the appearance of the hourglass stomach. The two sacs are connected by a very narrow canal often assuming the shape of the letter B. The incisura is a persistent standing contraction, especially when the ulcer is in the florid stage. It does not disappear under active belladonna administration. While the incisura is not a constant accompaniment of gastric ulcer it may, however, at times be the only evidence of ulcer. An incisura may likewise manifest itself from reflex causes when diseased conditions exist in other abdominal viscera. It can, however, be differentiated by its transient nature, by its inconsistency in position, and by its disappearance under active belladonna administration.

2. Diffuse gastrospasm is a frequent accompaniment of gastric ulcer. It may be remote from the seat of an ulcer, differing from the incisura, and involves the most active portion of the stomach, the pyloric segment as far as the incisura angularis. It causes considerable distortion of the pars pylorica, often simulating carcinoma. The contour may appear angular or choppy or may simulate a corkscrew. Fig. 3 gives a fair indication of its appearance. The rhythmic peristaltic waves fail to pass over and very often the röntgenologist encounters great difficulty in the differentiation from malignant infiltrations. Only good doses of belladonna and the clinical picture will solve this problem. The spasm will interfere with gastric motility.

3. Spasm of the pyloric sphincter arises from irritation of an ulcer situated in the pyloric segment at or close to the sphincter. The pylorospasm may be so intense as to cause marked interference with the emptying time and the six hour examination will reveal a large residue, the stomach often not emptying until the next day. How the mechanism of retention is brought about and how the state of the pyloric sphincter governs the exit of the food under abnormal conditions will be discussed below.

Motility.—Disturbances in motility as manifested by retention at the end of six hours is present in about fifty-five per cent. of gastric ulcers. The closer the ulcer to the pyloric sphincter the greater will be the six hour residue. Ulcers situated in the pars media may not be accompanied by retention. If so, the retention is small and is situated to the left of the median line. In pyloric ulcers

the residue is large, crescentic in outline, and is centrally located, the retention, lying closest to the seat of the ulcer. The size of the residue varies from one quarter to three quarters or more of the meal partaken. Large retentions are also met with when the ulcer is in the active stage and is associated with an inflammatory exudate. These often simulate organic stenosis. When the active stage subsides the six hour retention becomes considerably lessened or may totally disappear. In ulcers situated at the pyloric sphincter the stenosis may be complete, and the meal may then be retained for several days, the ectatic stomach finally relieving itself by vomiting large quantities of food. The characteristic three layers of vomitus in gastrectasia are then observed. The incidence of gastric retention is not always due to the mechanical factor of stenosis, for retentions are continually encountered when the ulcer is situated remotely from the sphincter. Retentions may likewise arise from distant lesions of abdominal organs, such as appendicitis, cholecystitis, and renal calculi. Such retentions are due to disturbances in function of the pyloric sphincter, disturbances which arise from disordered vagus innervation manifesting itself in hyperacidity and hypersecretion. The pylorus becomes irritable and spastic and gives rise to the condition spoken of as pylorospasm. When lesions exist in a hypertonic or orthotonic stomach the retention due to pylorospasm will be greater than hypotonic lesions due to greater muscular strength. Under the fluoroscope the pylorus is seen to take on a sheared off or notched appearance. The meal is at first delayed in its passage and later on is seen to pass through in a very narrow stream, never filling the duodenum completely. Such spasm usually indicates ulcer at or near the pylorus. In



FIG. 3.—Penetrating gastric ulcer. Note the intense accompanying spasm in the pyloric region simulating a canalization of carcinoma defect.

ulcers situated distally from the pylorus the reflex spasm is only present in the first hours of digestion when food still fills the pars media. Later on, however, when the local irritation has disappeared the reflex pylorospasm will let up and the stomach will empty on time.

Ulcer situated at the cardia is a rare occurrence. It cannot be visualized on direct examination. The diagnosis must rest on the presence of indirect signs of cardiospasm, the lower end of the esophagus remaining filled and assuming a sausageshaped appearance, the food only occasionally dropping through in a thin stream. An incisura high up at the cardia may also be present. While cardiospasm may be the result of other conditions, a careful clinical history will aid in the diagnosis.

The röntgen methods of diagnosis of duodenal ulcer, like those of gastric ulcer, consist of: 1. Direct signs—visualization of the duodenal defect. 2. Indirect signs—hypertonus, hyperperistalsis, hypermotility, hypersecretion, spastic manifestations, and tender points.

DIRECT SIGNS.

Before entering into a description of the duodenal defect it would not be amiss to mention briefly the röntgen anatomy of the duodenum. The duodenum is made up of four portions: First, pars ascendens superioris, also called duodenal bulb or cap; second, pars descendens; third, pars horizontalis,

gular shape, as is seen in the fishhook or the other forms.

Duodenal defect consists of a distortion in the contour of the duodenum. The irregularity may assume any form or size, and may be seen on any of the borders, most often on the mesial border. The duodenal defect is due to organic structural changes in the walls of the duodenum. It may also be due to associated spasm. Carman states that the defect always appears larger under the röntgen examination than when seen at the operation, which he explains is due to the associated spasm. Figs. 4, 5, 6 and 7 give a fair idea of the different types of duodenal defects. They usually appear as craters which may be very small, Fig. 7, or sufficiently large to distort the entire surface of the duodenum, as is seen in the large clover leaf defect in Figs. 4 and 6. Sometimes the defect may appear as a niche, similar to gastric ulcer, and occasionally an accessory pocket is encountered. An incisura occurring in the plane of an ulcer is often seen. At times no defect may be visible but the duodenum appears small and contracted. When such obser-



FIG. 4

FIG. 5

FIG. 6

FIGS. 4, 5, 6.—Various types of duodenal ulcers showing the defect of the first portion of the duodenum. Note the persistent defect in the multigraph exposure.

and fourth, pars ascendens inferioris. The first portion or duodenal cap is the one of most interest to the röntgenologist. Nine tenths of all duodenal ulcers occur in the first portion. The duodenal bulb varies in size and somewhat in shape with the type of stomach. Rising above the pylorus, the duodenum communicates directly with the sphincter. The cap is one inch to an inch and a half in size and is triangular in outline, with the base below and the apex above. It presents a smooth and regular appearance. The duodenohepatic ligament anchors the summit of the first portion of the duodenum. In the subtonic type of stomach the duodenum is larger in size and is seen filled most of the time. This is due to the low and sagging lower pole of the subtonic stomach, which causes traction in the duodenohepatic ligament, thus increasing the bend between the first and second portions. In the steerhorn stomach it is often with difficulty visualized, appearing small and situated posteriorly to the pylorus, and may also be directed downward. It does not assume the typical trian-

gular shape, as is continually noted the röntgenologist should be on his guard, for there may be a small mucous ulcer present. Distortion in contour may sometimes occur from adhesions arising from the gallbladder. Such defects, however, do not present the regularity or constancy of an ulcer. Pressure on the outer border of the duodenum from an enlarged gallbladder does not offer any difficulty or differentiation. Finally a sufficient number of exposures must be taken to satisfy the observer as to the presence of a normal or abnormal duodenum. All positions should be utilized, including the first and second oblique.

INDIRECT SIGNS.

Hypertonus.—In duodenal ulcers the stomach assumes the hypertonic form. The alteration in type is due to the increase in tonus which may either be due to reflex stimulation arising from the irritable ulcer or from the more energetic contractions in the effort to overcome a spastic duodenum. Thus we often see a stomach of the fishhook type with a vertical axis change in position and form. The

stomach rises higher in the abdomen and assumes an oblique to a transverse axis. These changes in form and axis are due to the increased state of tonicity of the vestibular portion of the stomach. In long standing callous ulcers of the duodenum with stenosis the stomach will gradually assume

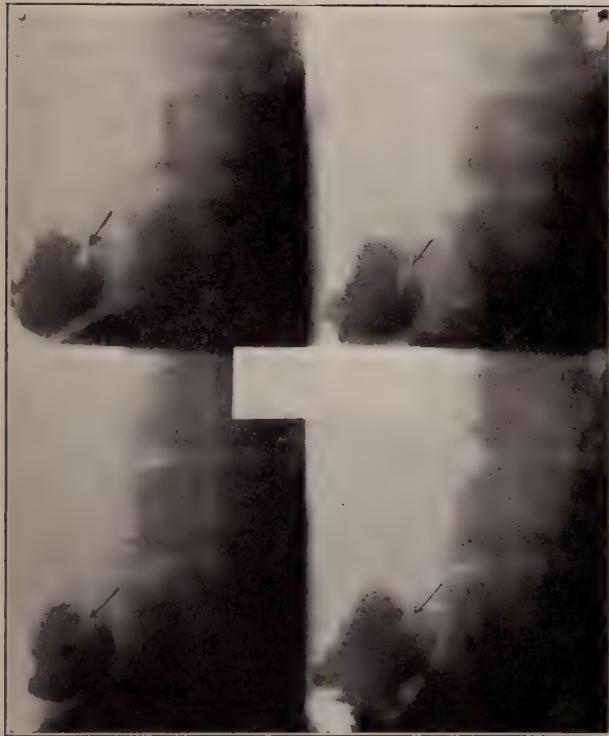


FIG. 7.—Defect under röntgen examination due to associated spasm. The surface of the duodenum is distorted.

the hypotonic and atonic forms from exhaustion of the muscular fibres, spoken of then as loss of compensation.

Hyperperistalsis.—Hyperperistalsis is characteristic of duodenal ulcer and occurs in a large percentage of cases. There occurs not only an increase in the wave depth but also in their number. The wave begins high up at the cardia on both curvatures. Several waves simultaneously travel briskly toward the pylorus. The four to five cycle stomach is most often seen. When a meal is given it is retained somewhat longer in the cardia on account of the increased peristole. When reaching the caudal portion the initial peristaltic wave is more intense and the meal is at once seen to pour out copiously through the duodenum. The normal five to ten minutes period of delay is shortened and the regular waves soon set in. The energy and depth of the waves are marked not only in the antrum pylori but high up in the pars media, the antrum however exhibiting several large deep indentations. As digestion progresses short periods of rest are noted, the stomach becoming completely relaxed and no peristaltic waves being seen. If gentle abdominal massage is used the stomach will at once stiffen up and again repeat the violent convulsive contractions. These periods of intermission increase with the size and extent of the ulcer and are due to an increasing exhaustion of the gas-

tric musculature in the effort to compensate the obstruction. With moderate degrees of obstruction the antrum appears distended and is a significant finding in duodenal ulcer. When the ulceration has extended to the pyloric sphincter the picture of the ectatic stomach of the pyloric ulcer with stenosis will repeat itself.

Hypermotility.—Hypermotility is another factor in duodenal ulcer, provided marked obstruction does not exist. As mentioned before, rapid evacuation is continually observed during the fluoroscopic examination, the meal passing with great rapidity through the duodenum often never allowing the duodenum to fill completely. The advance of the meal through the intestinal canal is also rapid. Normally the head of the contrast meal is seen at the hepatic flexure at the end of six hours, being evenly distributed in the terminal ileum, cecum and ascending colon. In duodenal ulcer, however, the advance of the meal is more rapid and the head of the advancing column is beyond the midportion of the transverse colon and may be seen as far as the sigmoid (Fig. 8), very little remaining in the terminal ileum. The stomach empties early. In uncomplicated duodenal ulcers it may empty within two or two and a half hours or even earlier. When hyperacidity, hypertonus, and associated pylorospasm supervene a small six hour retention is



FIG. 8.—Callous ulcer of the duodenum on the indirect evidence. Retention and colonic hypermotility at the end of six hours. Incidentally the ulcer defect of the duodenum is also seen.

met with. This retention is made up mostly of gastric secretion holding little of the contrast substance in suspension. If a tube is introduced no food particles are withdrawn but a large quantity of clear secretion with a little barium are obtained. Later, however, when stenosis takes place the six

hour residue will vary with the degree of the stenosis and will simulate pyloric ulcer. In such cases, aside from the duodenal defect, the presence of exaggerated peristalsis will always help in the differentiation of the two conditions.

Hypersecretion.—Hypersecretion is the fourth and final "hyper" characteristic of duodenal ulcer. It should be looked for only in the fasting stomach or at the six hour examination when using the



FIG. 9.—Note the intense spasm on the pars pylorica, both on the lesser and greater curvatures accompanying duodenal ulcer.

double Haudeck meal and can then be demonstrated by the presence of the horizontal base line of the *magen-blase*, and fluoroscopically by the visual succussion of the fluid. If the meal is administered in the presence of secretion it does not hug the lesser curvature but is seen to drop through the fluid like molasses through water. When the stomach is full with the buttermilk barium mixture, if secretions are present they will rise to the top and form a layer of a lesser grayish density intervening between the *magen-blase* and the meal. This is not due to sedimentation of the meal, for it becomes at once apparent, and furthermore the buttermilk mixture does not settle.

Spastic manifestations.—Gastrospasm is usually an accompanying factor in duodenal ulcer. It may occur in the form of an incisura or less commonly as a diffuse gastrospasm. Fig. 9 represents a constant defect in the pyloric segment due to reflex gastrospasm from duodenal ulcer simulating malignant infiltration. A reexamination after active belladonna administration relaxed the spasm and the distortion in contour disappeared.

Tender Points.—Tender points in duodenal ulcer are not a dependable sign. The writer has seen

many outspoken duodenal ulcers without tender points. When the ulcer is large enough, however, or is in the acute stage, or when periduodenitis is present, then tenderness is quite manifest. Similarly, in gastric ulcer the niche along the lesser curvature is invariably tender and is always due to the accompanying perigastritis.

The indirect signs of hypertonus, hyperperistalsis, hypermotility and hypersecretion are spoken of as duodenal irritation and are not pathognomonic of duodenal ulcer. Pathological conditions in distant viscera are frequently manifested in reflex duodenal irritation. In the presence of a normal duodenal bulb one should hesitate to regard the case as one of duodenal ulcer. While a small ulcer may exist, under the circumstances it is not commonly seen, and a careful investigation of other possible lesions should be made. It is, of course, superfluous to state that such examinations should be routinely performed. The efforts of the examiner will then be amply rewarded.

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45 ST. MARK'S PLACE.

THE BENZYL BENZOATE TREATMENT OF WHOOPING COUGH.

By T. E. McMURRAY, M. D.,
Wilkesburg, Pa.

Satisfactory and immediate results can be obtained in the treatment of whooping cough by the use of benzyl benzoate. The dose given was from five to thirty minims every four hours, depending upon results. In some cases decided improvement was noticed from the smaller dose, in other cases larger doses were employed. In almost every instance the treatment determined subsidence of the paroxysms.

The effect usually made itself felt within forty-eight hours and in one instance there was relief after the second dose. As a rule the relief is immediate and complete. Although it is necessarily somewhat difficult to estimate the efficacy of a remedy in such a capricious disease as whooping cough, I think I am entitled to conclude from my experience that it not only does in many cases afford immediate relief of severe spasms of coughing, but it also seems to lengthen the interval between attacks. As far as my experience goes, this treatment gives rise to no undesirable results. I gave twenty minims to a child twelve months of age with no evidence of gastric or any other disturbance.

553 TRENTON AVENUE.

DIAGNOSTIC CHARTS AS A GUIDE IN THE STUDY OF GASTROINTESTINAL CONDITIONS.

By I. O. PALEFSKI, M. D.,
New York.

The correct diagnosis of abdominal conditions necessarily requires observation based upon the results of extensive clinical and röntgenological examinations. From the cases studied by us within recent years, we observed that errors in diagnosis were most frequently the result of brief histories or hasty examinations. Another common cause was the overemphasizing of one procedure at the

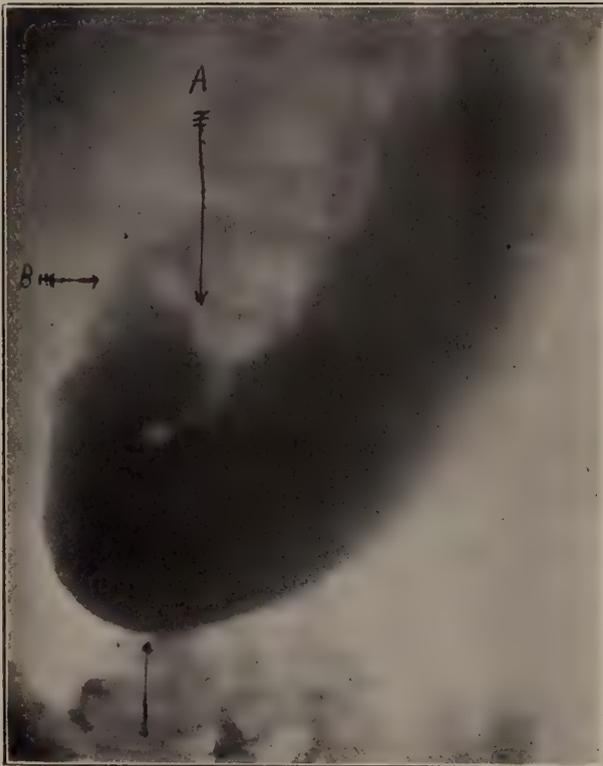


Fig. 1.—Filled stomach, erect posture; A, moderately dilated and drawn to right of spine; B, duodenum not properly filled.

expense of, or even to the exclusion of, other equally important ones.

Such studies must not only be made from every angle but the diagnostic data gathered must be properly recorded for reference. Gastrointestinal disturbances are sometimes the expression of an organic disease outside the gastrointestinal tract and which makes itself apparent months or years later. Hence all evidence must be noted and recorded. Again, the recording of such data must not entail too much clerical work as it is not practical in private practice. On the other hand, loosely kept records and prints of x ray negatives are likely to be misplaced and the record of the whole case soon becomes a matter of memory.

We have, therefore, devised a folding card system comprising four printed forms for the history, physical, clinical, and röntgenological findings. Prints of the reduced x ray negatives are attached and the whole can be conveniently kept in a record



Fig. 2.—Filled stomach, prone; normal appearance.

cabinet or bookcase. These charts require the least amount of writing as only abnormal or unusual findings need be recorded, while the unfilled parts represent the normal. A duplicate of this card is sent as a report to the physician.

The printed form for the history permits a de-



Fig. 3.—Six-hour plate; A, appendix well visualized.

tailed description of the personal habits, character of meals, menstrual and marital history, and a careful analysis of the symptoms of the present complaint. Improper habits, indiscretions in diet, gynecological disorders and previous pregnancies and labors, have a direct bearing upon the present



Fig. 4.—Forty-eight hour plate; A, appendix still visualized.

complaint in a large number of patients with gastrointestinal disturbances.

The printed form for the physical examination provides for a general examination and detailed description of the abdomen and fluoroscopy of the gastrointestinal tract. The findings elicited in the physical examination of the abdomen, are represented by their initials inserted at the corresponding areas in the diagram.

We believe that these folding charts¹ offer not only a convenient and timesaving method for the recording of data but will prove a guide to the busy practitioner in obtaining careful histories and physical examinations essential for correct diagnosis in abdominal conditions.

156 WEST EIGHTY-SIXTH STREET.

Resection of Double Kidney.—Frederick C. Herrick (*Surgery, Gynecology and Obstetrics*, June, 1920), presents his conclusions in the treatment of double kidney: 1. Resection of a diseased double kidney or the diseased portion of a single kidney may be advisable in order to save a necessary amount of kidney substance for the individual. 2. The resected end surface should be covered with fatty capsule. 3. There were found in the literature four other reported cases of resection of double kidneys.

¹The folding charts will be included in the author's reprints.

PLEURAL DISEASE IN INFANTS AND CHILDREN.*

With Special Reference to Empyema.

By HARRY LOWENBURG, A. M., M. D.,
Philadelphia,

Pediatricist to the Mount Sinai and Jewish Hospitals.

Dry pleurisy is common in infancy and childhood. It occurs as a primary disease but more often is secondary to lobar or bronchopneumonia, forming a part of the complete clinical picture of nearly every case of the first. Nonpurulent pleural effusion is more often a primary disease than dry pleurisy. It, too, more often follows lobar pneumonia. Purulent pleuritic empyema commonly follows pneumonia and may rarely be a primary disease, or rather it occurs as a sequence to or is a secondary stage of primary nonpurulent effusion. In infants and young children tuberculosis as an etiological factor plays comparatively a minor rôle.

DIAGNOSIS.

Years ago I drew attention to the fact that on the left side in infants and children the breath sounds are harsher and louder than they are on the right side. This fact is too little recognized and leads to the suspicion of fluid on the right side when no fluid exists. It must further be borne in mind that the breath sounds, especially in infants but also in young children, are sometimes not at all interfered with as to their transmissibility and in the majority of cases but little. This is due to many causes—the thinness of the chest wall and frequently because there is either a compressed (carnified) or consolidated lung from which bronchial breathing emanates. This, being loud, is more readily transmitted. Hence reliance for a conclusive diagnosis may not be placed upon auscultatory phenomena.

Percussion yields the best results. Two percussion phenomena are of particular value, as follows: 1. There is a widespread area of impaired resonance or dullness (depending on the amount of effusion) which is out of proportion to the degree of dyspnea. In other words, if the same area of impairment depended upon solid lung there should and would be very difficult breathing, perhaps orthopnea and cyanosis. Impairment in the axillary spaces or the lateral aspect of the chest is always highly suggestive. 2. Just as important is the widespread area of a sense of increased resistance which is revealed by what may be termed light massive percussion or, perhaps better, light palpatory percussion. This is practised by lightly tapping the thorax with the tips of five fingers of the outspread hand. The difference experienced between the two sides in on-sided effusion is extremely well marked. With these two signs in evidence the results of thoracic puncture, the concluding evidence of fluid, if positive, but not of the absence of fluid, if negative, may be predicted with almost absolute surety.

A word as to which interspace should be the one of preference for thoracic puncture may not be amiss. On this topic textbooks should be rewritten. No special interspace may be named. Puncture

*Read before the Northern Medical Society, as part of a symposium on pleural disease, January 23, 1920.

should be made where physical signs indicate the presence of fluid. Space for discussing the value of x ray studies, which should always be made in hospital cases, if for no other reason than for purely pedagogical purposes, is not available, and for the same reason discussion of the treatment of nonpurulent pleural effusion will be omitted.

When asked to participate in this symposium I eagerly accepted mainly for two reasons. First, it gave me a formal opportunity to say something frankly, and I trust without offense, to the surgeons; second, it gave opportunity to express, with due humility, in the capacity of pediatric internist, certain views as to the surgical treatment of this serious and death dealing condition. These views, in my judgment, in principle at least, offer encouragement as to the possibility of a greater number of cures. I desire it to be borne in mind that the opinions here expressed are personal ones, given, however, as a pediatricist and are born of the disastrous results experienced in many cases, handled by competent surgeons. If any of my hearers desire to apply these views to the adult they do so on their own responsibility.

CRITICISMS OF SURGERY AND OF SURGEONS.

The surgeon has taken from the medical man, one by one, his right to treat disease after disease, and perhaps justly so. His conquests, however, have made him arrogant (shall we say egotistical?) and even at times insolent and abusive toward his medical colleague, who conscientiously, and not always wrongly, may differ from him. Appendicitis, gallbladder and pancreatic disease, malignancy in its protean manifestations, hernia, gastric and duodenal ulcer, pyloric obstruction, goitre, uterine fibrosis, tonsillar disease, prostatic hypertrophy, etc., have rightly been removed from the realm of the medical idler, the therapeutic procrastinator, and have been preempted by the surgeon. Woe to that medical philosopher who presumes to take sides against his surgical brother in dealing with the conditions aforementioned! How scathing his chastisement! How humiliating his ridicule! How damning his censure! But unlike Duncan, the illustrious king of Scots in Shakespeare's *Macbeth*, he, the surgeon, hath not borne his great office so meekly. To misquote further the bard of Avon, he assumes a virtue and he has it not, with reference to this disease, empyema. He has taken this disease to his bosom as his own. Like the ubiquitous traffic officer automatically he raises his warning hand and says "Thou shalt not. This is the acreage for angels' feet to tread and fools may not enter. You have no opinion worthy our contemplation or consideration. Do not forget ye are but medical men and in matters surgical ye dare not speak. Content ye therefore yourselves with making mistakes in diagnosis and with telling us where pus lies concealed after we resect the wrong rib and we will do the rest. And verily so it comes to pass. The rest is done and often it is for long and frequently it is a rest eternal and everlasting!"

To face facts, may one not ask what in all honesty has the surgeon done for empyema? Do his results warrant his right to assume dictatorship over

this disease or to refuse the advice and counsel of his medical colleague? Has he provided us with a clear cut reliable method of procedure based upon old well tried principles or enunciated upon a new but demonstrable hypothesis? In my experience he has done neither. He can approach no single case with a reasonable degree of definiteness that this will follow that. His results fall all but short of being a reproach to himself and his profession. The salvation of both lies in the fact that there is probably a limit to human effort. But the surgeon fails to recognize that this applies to himself and to surgery but (shall we say generously?) grants this distinction to his medical coworker. The fact remains, however, that both the surgeon and surgery have failed to solve this problem. The former has been myopic in his viewpoint. He has not made the best use of the means at hand. He has limited the application of simple principles which are limitless in their scope. Hence the total morbidity and total mortality of empyema remain unchanged. Hence the surgeon is helpless in so far as he is forced to seek information and to accept advice in spite of himself irrespective of its source, be this even from, in his judgment, the mind of the avirile medical man.

ADVICE TO THE SURGEON—INCLUDING THE EXPRESSION OF THE VIEWS OF A PEDIATRIC INTERNIST AS TO SOME OF THE PRINCIPLES UNDERLYING THE SURGICAL TREATMENT OF EMPYEMA.

The pediatricist has no quarrel with the surgeon as to the necessity for the surgical treatment of empyema. Neither has he nor has any sane physician any quarrel with anyone who advocates thorough drainage as the *conditio sine qua non* in the treatment of this disease. Anyone who, however, has witnessed the poor and uncertain results already referred to which commonly follow costatectomy, which are served up to the medical man and his patient with a monotony worthy of the effrontery and calm stoicism of the proverbial boarding house mistress, as the piece *de resistance* of the meal, must seriously differ from the surgeon as to how best drainage is to be induced.

Costatectomy, in my experience at least, is responsible for no more recoveries than is simple, well conducted, and intelligently performed thoracotomy. In truth, it has not given as good results, for I have witnessed more recoveries and prompter ones from this procedure than from costatectomy. Hence it is my conviction that costatectomy never saved a case of empyema that would not have been saved by thoracotomy. Surgeons are to blame for this. They do not conduct the aftertreatment in their cases with the patience and care which are required, and it is but a few days after the costatectomy is performed that the same conditions obtain which call forth and warrant the surgeon's criticism of the average thoracotomy, viz., a walled off sinus of the chest, leading to where no one knows, and probably draining anything but the proper area. It is no argument in favor of costatectomy to say that a larger opening may be made than by thoracotomy. This larger opening is of no

avail if it does not drain the proper area, and this often happens, because most good surgeons are poor diagnosticians. Better a small opening made by a thoracotomy over the area to be drained than a larger one made by costatectomy over a dry area. However, the truth about the proper treatment of empyema will never be reached by arguing the respective merits and demerits of these two surgical procedures. Both may give good results if properly performed, and both may give poor results if improperly conducted. What is needed first is a proper diagnosis of the exact location of the pus. After this the crux of the situation lies in securing the greatest amount of thorough drainage and disinfection with the minimum amount of trauma. If a thoracotomy will do it, that is the procedure of choice; if not, a costatectomy must be performed. Here is where good judgment is necessary. In my experience, simple, well conducted thoracotomy done in a manner to be described will give the best results.

WHEN TO OPERATE.

No empyema should be operated upon as soon as diagnosis is made, unless the mechanical disturbance resulting from the effusion itself is so great as to cause alarming symptoms; at least, no radical step should be undertaken. Simple aspiration may be done at first, purely as a measure of relief. The reasons for this are plain. No opening in the chest may be made and maintained without the development, at least subsequently, of pneumothorax. Clinically it has been experienced that pneumothorax, within certain limits, is a bugaboo of the past and may be ignored, inasmuch as its influence is negligible as far as retardation of recovery is concerned. Nevertheless the work of Major E. A. Graham and Captain Richard D. Bell clearly indicates the lethal influence of pneumothorax, due to a large opening in the chest wall, in cases where the entrance of air into the lung is impeded by obliteration of the alveoli or bronchi, i. e., where the pressure of the air entering the thorax through the artificial opening exceeds that which enters through the normal channels. Asphyxia promptly supervenes. These conditions obtain in nearly every case of empyema, inasmuch as acute pneumonia precedes or accompanies the disease. Hence at this stage the danger from acute pneumothorax is real and readily apparent. Later, after the pneumonia has subsided, the influence of the pneumothorax within certain limits, as that induced by the average thoracotomy or costatectomy, may be ignored.

Further, patients in whom the temperature remains high are poor operative risks and frequently become extremely septic and succumb to this condition. Those in which the temperature has struck a lower level or even becomes normal, and those in which the effusion is in fact not only purulent but thick, give the best prognosis. Cases in which the fluid is "on the turn" often do badly. The former may be said to be ripe. Hence cases in which the diagnosis is made late or when the diagnosis was missed do best of all. To summarize, therefore, it may be said that no empyema should be operated upon until the evidences of acute pneumonia and

of hyperpyrexia have disappeared and until the pus has become thick.

The following method of handling empyema cases is followed in my private work and in that portion of the pediatric service under my control at the Mt. Sinai Hospital:

The diagnosis is made by physical signs. It is confirmed by exploratory puncture over the area as indicated by these signs. The pus is studied physically (most important) and bacteriologically. An x ray examination of the chest is made and carefully studied with the röntgenologist for evidences of lung consolidation. If this is present and the fever is high nothing is done, or aspiration is practised if indicated. When these have disappeared an ordinary curved or straight adult sized trocar and cannula, such as that used to do paracentesis abdominis, is pushed between the ribs, where a careful study of the physical signs and of the x ray plate and the results of puncture indicate the best situation for drainage, and as much pus as will is permitted to flow into a pus basin, the entrance of air being ignored. The cavity is gently washed with a warm Dakin's solution, the volume entering the chest at one time, never being permitted to equal or to exceed the amount of pus removed, otherwise excessive coughing ensues. A rubber tube large enough to fit the opening is fixed in place, and through this once or twice a day the cavity is irrigated. I have treated many cases this way, having the patients brought to the office. When the temperature subsides the washings are gradually discontinued, and finally the tube is removed and recovery ensues. The success of this method depends upon the proper placing of the drainage tube so that it drains the bottom of the cavity, and it must be carefully considered which is the bottom, when the child is sitting or reclining. Hence it is important to indicate which position is the best for the patient.

If the temperature rises again careful physical and, if necessary, an x ray examination is again made, and if the needle reveals pus this area is treated in exactly the same manner. It may be well to make x ray studies with the tubes in position to see that they are properly placed. Fenestrated tubes are employed. If more than one tube is in the chest at one time it is desirable to secure through and through drainage, in other words, to see the fluid leave the thoracic cavity by one or more tubes, inserted at various places between the ribs, after the fluid has been gently injected through any one of them. This would indicate that communication is established between the areas drained and that adhesive bands are few.

To summarize again, it may be said that our studies lead us to believe that multiple thoracotomy, or, if you will, multiple costatectomy, to satisfy the obsession of the "costatectomatized" surgeon, done at different levels of the chest wall or over the areas where it is positively revealed that pus exists and that these areas are not drained by the original opening, will be the primary operation of choice, even in cases of empyema where it is known that a large free effusion exists. Thus with two or three or more tubes inserted between various ribs, some just within the cavity and some placed deeper

as the x ray may reveal the necessity therefor, every hour, or every two hours, or every three hours, or more, thorough irrigation of the entire cavity may be done with warm Dakin's solution with scarcely any disturbance to the patient. When discharge ceases and when the culture reports become negative irrigation may be discontinued and the tubes removed. This method is thought to be decidedly more practical and thorough and scientific than that advocated by a prominent surgeon who does a large single thoracotomy and places a series of tubes in the thoracic cavity in a hit or miss fashion, i. e., admittedly he does not know exactly what direction they will take but hopes they will drain the areas affected. Through these tubes he practises frequent irrigation.

The advantage of the method proposed over this is that in encysted cases the definite diseased area is drained, and where free fluid exists the danger of encystment is lessened, since the whole cavity is irrigated and drained thoroughly because the fluid enters and leaves at various levels, from the lowest to the highest, and drainage takes place whether the patient is either prone or erect.

CONCLUSIONS.

1. Surgeons and surgery have failed to give a definite method for the treatment of empyema.
2. Their right to preempt this disease is therefore denied.
3. A correct diagnosis as to the location of pus must precede all methods of treatment.
4. No patient should be operated upon until the evidences of pneumonia have passed and until the temperature has subsided and the pus has become thick.
5. Aspiration should precede permanent drainage, if there is mechanical interference with breathing, until the conditions mentioned above have been met.
6. Neither thoracotomy nor costatectomy *per se* offer any special advantage to the patient if indifferently performed.
7. The size of the opening is not nearly so important as the position of the opening.
8. Thorough drainage with proper irrigation of the infected area or areas, with a minimum amount of trauma, is desirable.
9. For this reason alone thoracotomy is to be preferred to costatectomy.
10. Personal experience would seem to indicate that multiple thoracotomy is the operation of choice.
11. A reasonable amount of pneumothorax in the absence of pneumonia is negligible.

2011 CHESTNUT STREET.

The Nutritive Value of Commercial Corn Gluten Meal.—Carl O. Johns, A. J. Finks, and Mabel S. Paul (*Journal of Biological Chemistry*, March, 1920) found that eighteen per cent. of whole, ground, yellow corn meal furnished an adequate supply of water soluble vitamins to rats. Commercial corn gluten meal supplemented by dried brewer's yeast, whole, ground, yellow corn, or cocoanut-press cake furnished the necessary protein for normal growth.

TREATMENT OF TUBERCULOSIS.

Clinical Case Reports.

BY BENJAMIN S. PASCHALL, M. D.,
New York.

(Concluded from page 98)

CASE VII.—D. K. is a patient of whom I was particularly proud for a long time. He made a wonderful record for himself and was apparently well at the end of his twentieth dose. He was a young man twenty-five years of age with both kidneys infected and numerous definite pulmonary lesions. There appeared to be considerable activity in the lungs though tubercle bacilli were not demonstrated in the sputum. They were repeatedly found in the urine. After the twentieth dose he concluded to stop. We warned him emphatically that the disease would return unless he was treated to the point of three negative reactions, but we did not know till afterwards that he had taken up Christian Science. He discontinued treatment in 1916. For three years he did very well and then the disease began to return. The last year has been a bad one for him but he is still sticking valiantly to his cult.

CASE VIII.—L. E. E. is interesting because he had genitourinary tuberculosis in addition to acute nephritis. He was a marine engineer aged forty, and had numerous sinuses from old tuberculous abscesses, all of which promptly healed on mycoleum. He was treated in an extremely irregular way because of his occupation but we seemed to keep him alive year after year by giving him an occasional dose. He had tubercle bacilli in his urine and albumin. These finally disappeared and his albumin dropped from four per cent. to five per cent. to a trace when last seen. I put him on treatment in 1911 and saw him last in 1917. A case of this kind is interesting because it illustrates the effect of mycoleum over long periods of time in the most hopeless kind of a patient who is in too bad condition to work and who still manages somehow to hang on to his position. There is nothing to be done to improve the hygienic conditions and the patient himself is and has been for years a wreck and a derelict, just holding on to life by a thread.

Of one thing I am convinced and it is the thing I am trying to make clear in this paper. If we cannot cure many of these old, hopeless, long standing chronic cases, we can at least patch them up so that they can live along in comfort and support themselves and their families and feel well enough to enjoy life at the same time.

CASE IX.—O. O., aged twenty-two. He was long suffering, and had a long standing, tuberculin treated prostatitis and epididymitis. He was placed on treatment in 1915 and given fifteen doses of mycoleum. His symptoms disappeared, his prostate subsided as did his right epididymis. His left had previously supplicated, leaving a sinus which closed. His Wassermann was negative and he had never had gonorrhoea. During his treatment he did heavy work as machinist in railroad shops.

CASE X.—W. I., colored, aged thirty-six, ship's steward, was an interesting patient. He had genitourinary tuberculosis; the kidney, bladder and pros-

tate were involved. The Wassermann was negative but he probably had a latent gonorrhoea of long standing. After the sixth dose of mycoleum an enormous abscess developed in the lower hypogastric region, supposedly from a tubercle in the anterior bladder wall. He was taken to the hospital but the abscess broke before he reached there and there was nothing for the surgeon to do but make the observation that it was evidently tuberculous and that it had pointed both ways, since the urine was pouring freely through the torn bladder wall.

Accordingly, he sutured up the rent in the bladder wall in the forlorn hope that it might hold. Three weeks later the patient left the hospital with the area completely healed and in apparently excellent condition and when last heard from three years later had remained well. The surgeon then wanted to know if it was the rule that my cases of tuberculous abscesses healed without sinus formation and he was told that it was the invariable rule provided the patient had received six doses of mycoleum.

When one comes to tuberculosis of the bones and joints, a consideration of their pathological conditions becomes necessary. Here the disease invades two main structures and confines itself so exclusively to them that the surgeon takes constant advantage of the facts elaborated by the pathologist. Tuberculosis of the bones invades the synovial structures and the red lymphoid cellular spongy or cancellous portion of the marrow of the bone. If it invades the epiphyses first from the blood stream and then finds its way to the joints by extension, it is in its earlier stages easy to control, because it is the portion of bone which is most perfectly supplied with circulation and into which wax splitting ferments most thoroughly and quickly penetrate following mycoleum injections. If, however, it invades the synovial membranes and joint cavities primarily, as it frequently does in adults, the picture then becomes just the opposite.

Here we have about the worst structures in the body for exchange of fluids, and wax splitting ferments being of the peculiar physicochemical composition described it is easy to understand how they would penetrate into this particular area of disease with great difficulty until the disease had progressed to a stage where the synovial structures had become sufficiently disintegrated for the wax ferments once more to exert their characteristic action. This puzzled me for a number of years because my early cases with synovial affections did badly while the later ones began to clear up from the very first dose, in the majority of cases. Adult forms of bone and joint tuberculosis also recover less rapidly than they do in children no matter in what form the disease appears.

In tuberculosis of the bones and joints of children, the immunizer must realize that while the advice and help of the surgeon is invaluable, the necessity of administering from six to twelve doses of mycoleum is of paramount importance before any drastic surgical measures are thought of, after which they will be unnecessary. If this can be accomplished first, the surgeon, if he does anything at all, can proceed as if the involved bone or joint

were a sterile cavity. Necrotic material or sequestra may be removed and the rest may be safely left to take care of itself.

CASE XI.—H. S. was sent to me early in 1909 with a tuberculous knee of two years' standing. He was four years old. His mother and sister were tuberculous and received treatment. This is one of those cases which had been observed over a long period of time but not treated with mycoleum until late in the process. During the first five years, with plaster casts and other suitable orthopedic appliances, the knee was kept, as we thought, in fairly good condition. It was necessary to keep some sort of apparatus on most of the time to prevent undue contracture, but it was evident that the child was growing up without showing any tendency to throw off the disease constitutionally even with the best of treatment, which he certainly had. He was first treated with tuberculin, except three years when the family was in another city. In 1914 he returned and we started to give him mycoleum, but it immediately became apparent that its use had been postponed too long and that the necrosis in the knee joint was too extensive to be longer ignored, and accordingly he was turned over to the surgeon. As soon as they opened the knee, it was evident that the damage had become so great that it was doubtful if excision would be feasible, though it could be tried, with a subsequent amputation if this failed. We decided that he had not been treated thoroughly enough with mycoleum and also argued against excision, on the ground that even this could be done later. For this I was properly rebuked by the surgeons, but the boy's mother and I refused to be moved. There was a cavity where the knee joint properly belongs into which one could have inserted a small sized orange after it had been curetted. Eighteen months later I had an almost perfect functional result, a straight leg which could bend to a right angle, and less than one quarter inch of shortening, and the x ray showed complete bone replacement. At the present time after six years it would be hard to convince anyone, even the most experienced, of what the boy has been through in the way of damage done, taking into consideration the causative factor of tubercle bacillus. The surgeons were my friends and they knew some very good things about mycoleum, but they could see no possible chance for the bone to fill in in the first place or the prevention of ankylosis in the second.

We did have to keep working to prevent the second complication, but we managed to get a fibrous covering that answers very well for a joint in the knee.

CASE XII.—Mrs. H. C. developed a tuberculous synovitis in the right hip which terminated in abscess formation. The pus was evacuated by simple incision and she was sent to me for treatment. She received twelve doses of mycoleum; the sinus promptly healed and she was discharged apparently cured. She has remained well since.

CASE XIII.—B. V. W. came from a country hospital, took her doses and returned from whence she came. She was aged twenty-seven and suffered from tuberculosis of the hip. She also had intes-

tinal tuberculosis. Both had been of many years standing and she had been a public charge for a long time. Somehow, she heard of me and the county authorities allowed me to treat her. After nine doses of mycoleum she was apparently well and returned to work for the first time in many years as maid in domestic service. I do not know whether or not she relapsed.

CASE XIV.—J. O. N., aged thirty, farmer, was operated on a number of times for tuberculosis of the elbow. It had involved the joint and there was considerable ankylosis when I first saw him. He was absolutely unable to use arm or hand and his pain was so great and so constant that he spent most of his time in the barn so that his wife and children could not hear him moaning in his suffering. When I first saw him, he could not hold an empty tumbler in the right hand and his surgeon sent him to me as a sort of a forlorn hope before doing an excision of the elbow. He received sixteen doses of mycoleum, made the usual recovery and since he lived where it was impossible to have the surgeon constantly limber up the stiffened arm, I suggested that he rig up an orthopedic appliance in the barn with the crank of the grindstone which would work free the elbow joint. I did not see him for several months after that but when I did I asked him about it. He said he had not used it because loading the team with two hundred pound milk cans twice a day had the same beneficial effect and driving a team of spirited horses tandem over rough roads twice a day had a straightening effect. His course of treatment extended over fourteen months. I might add that the pain stopped six hours after the first dose had been administered and never returned. He has remained well since that time.

What has been said before in regard to the important points in differential diagnosis particularly applies to intestinal tuberculosis. Gonorrhoea must be excluded in women. Typhoid fever sometimes simulates tuberculosis, but repeated attacks with suspicious pulmonary findings aid in making a provisional diagnosis. Usually the appendix has long since been removed by an earlier observer of one of these intestinal attacks. Care must be taken to differentiate the acute flare up with stenosis or obstruction plus the recurring attack. The gas, the exquisite tenderness, the constipation, the rigidity, the distention and the vomiting, sometimes fecal, together with the extremely severe paroxysms of pain, and often the fluid in the flanks, should immediately arouse suspicion of this form of tuberculosis, and when there is in addition a rapid pulse and moderate temperature the disease is usually well advanced with considerable accompanying peritonitis.

If one gives a dose of mycoleum to a patient in the midst of an attack of this character and a reaction follows (characterized by the occurrence of immediate soreness and swelling at the point of injection which continues to increase in size and soreness for several days together with constitutional symptoms accompanied by fever) one may then expect to see an immediate subsidence of the symptoms of the disease within a few hours and continuing to decrease in severity until they have disappeared entirely. The patient then goes about his

business and provided he takes his doses within reasonable limits of the prescribed intervals, there will be no further trouble and he will make a perfectly monotonous record for himself from this time on. There is nothing more dramatic than to see a bad case of this kind after the first dose.

CASE XV.—Mrs. S. E. B. was a patient of seventeen years' standing. She had been operated on and the peritoneum was seen to be studded with tubercles. She was sent home and continued to become worse in spite of good hygienic surroundings. Tuberculin was tried in competent hands without benefit. She was thirty-five years old and a confirmed invalid with a constantly elevated temperature and pulse. I put her on mycoleum in May, 1912, as a sort of last resort, in the hope that it might do her some good but that at least it would not do her any harm. She gave me one of those early surprises by getting up out of bed at the end of the first week and never going back to it. Please do not think that this is a miracle story until the rest is told. She also never ceased to tell about that first reaction and what it did to her leg. It is perfectly true that this is not an enjoyable form of treatment and no living human being would take it if were not for the overwhelming evidence to the sufferer of the subsequent benefit. She received fifteen doses during the succeeding three years, made a perfect recovery and has remained entirely well since that time.

Pulmonary tuberculosis deserves a separate consideration altogether from the forms hitherto discussed. The histology of the lung tissue must be kept constantly in mind when considering the feasibility of bringing wax substances and wax antibodies into intimate contact with the tissues, and the classification of the three main forms of pulmonary infection into fibrous, caseous, and general miliary does not materially alter the present description of sequences. Of course the fibrosis is the least permeable and the acute miliary form the most permeable to antibodies of this nature, while the caseous processes stand midway between.

Acute miliary is the most favorable form of pulmonary tuberculosis to treat, up to a certain sharply defined point, when the picture becomes reversed and the prognosis becomes absolutely unfavorable. This occurs as soon as the blood stream is sufficiently overloaded with toxins to disturb the antibody forming functions of the infected host, and in acute miliary forms it happens with great suddenness. Of course each case is usually more or less of a mixture of all three forms with one or the other predominating, but the encapsulating tendency is shown much earlier in the pulmonary than in other forms of tuberculosis, or else symptoms which make themselves known to the patient are prone to occur so much later in pulmonary forms that the therapeutic application of mycoleum becomes more difficult. There is a peculiarity of ferments of the lipase class before mentioned whereby they diffuse into infected areas with extreme slowness, which is an exceedingly important one, since the immediate action of the wax antibodies produced by an injection of mycoleum can only be successfully directed against those tubercle

bacilli which are actually free in the tissues or blood stream. Those organisms which are much more deeply seated and surrounded by the usual inflammatory area, including connective tissue, are only reached by degrees, and in some instances not until there has been an actual softening of the area in question. Since the number of free organisms at any time is small in comparison to those more or less deeply buried, it follows that the immediate reaction is always less than would be expected, while the length and ultimate degree of the reaction is of paramount importance. The reason for monthly intervals between doses is determined by these considerations. It is not uncommon in certain cases to observe a marked inflammatory local reaction keeping up for two and often three weeks after the injection has been given. In this report of pulmonary cases we will describe only those which present features of more than ordinary interest.

CASE XVI.—M. A., aged nine, pure American Indian, was brought to me with acute pulmonary tuberculosis. Both lungs were well dotted with tubercles of moderate size, and there was a running temperature of 104° in the afternoon and a pulse of 130 all the time. She had been treated with tuberculin for nine months without benefit. I put her on mycoleum in December, 1914, and gave her twelve doses in the following year. She made an apparently perfect recovery and was discharged with a normal temperature and pulse. Three months later she relapsed and the whole condition seemed as bad, even if not worse; her temperature was 104°, and sometimes as high as 105°, with an average pulse of 160. Of course her age was in her favor, but her race was against her, as none of these children from Alaska down to lower California have ever been reported to recover if pulmonary tuberculosis set in. Her sputum was swarming with tubercle bacilli and it was evident that she held her immunity badly. Accordingly I put her back on treatment and gave her twelve more doses during the second year. I did not dare to space the doses for fear of relapse, but at the end of this second course she seemed so well that I decided to space to ninety day intervals. Since that time she has received two doses a year until this year, when she was finally put off treatment. She is at the present writing normal and healthy in every way. There is absolutely and positively no doubt but that this patient would have died without mycoleum. She had been sick two years when I treated her, and was in very bad condition when first seen.

CASE XVII.—J. A. is another patient of the same type. He was thirty years of age and suffered from acute miliary tuberculosis. He was constantly being treated with a few doses, not enough to immunize him, but just enough to put him on his feet again when he relapsed, so that he could return to work. I first saw him in 1909 and treated him with tuberculin in addition to rest in bed in my sanitarium until his acute symptoms had subsided, but he did not improve much, as his case was of the acute type from the first. His exacerbations were always most severe with exceedingly high temperatures. He was an engineer and spent most

of his time going from place to place, unless he had to come in and be patched up. When he was out of work and out of money at the same time he would go without food for days.

These facts did not aid in the treatment, but it is necessary to mention them because every tuberculosis specialist knows how injurious these things are, and to show that mycoleum has not been used under conditions which were ideal but under such handicaps as physicians encounter in general practice among patients suffering from this disease. He had a bad relapse in 1913, received three doses, cleared up and went to work. There was another relapse in 1914, and both lungs showed scattered lesions over both sides to such an extent that I have him marked III on my records. During this time his temperature reached 105°, and once or twice went over this mark. During the next two years he received fifteen doses, and the disease apparently became arrested. He received five doses in 1916 and the lung findings cleared up. I saw him in 1918 and heard from him in 1920 when he seemed to be in good health. He weighed 135 when first seen in 1909, and weighs 155 at present.

CASE XVIII.—M. B. was seventeen when first seen. He had been raised in ideal home surroundings, and there developed a rather acute miliary tuberculosis about a year before he was sent to me. The x ray showed perihilar fibrocaceous tuberculosis somewhat bilateral, one side active and one side quiescent, which indicated considerable duration. He is marked II on the records. Temperature, 100°; pulse, 110. He was not under weight at the beginning but gained fifteen pounds on treatment and ten pounds subsequently. Received twenty-seven doses during 1914 and 1915, and has not shown the slightest tendency to relapse since that time. No change was made in his habits or mode of living. After the first six doses there was a complete disappearance of symptoms, which never reappeared. We did not get a final radiograph because the physical signs were perfectly satisfactory and he had to pass through other hands than mine. Tubercle bacilli were found in the sputum several times before I put him on treatment. This young man has been recently examined in the east and told that it is impossible to understand how he could have had a lesion from the present findings, although had a recent skiagraph been taken the old scars would have been quite apparent, since they are permanent. One must never forget to warn the patient if he has a second stage case that a subsequent examiner may be totally unable to make out a previous tuberculous infection treated with mycoleum unless this physical test is checked up by skiagraphic findings.

REFERENCES.

1. PASCHALL: NEW YORK MEDICAL JOURNAL, February 28, 1920.
2. *Idem*: NEW YORK MEDICAL JOURNAL, January 31, 1920.

NOTE: Mycoleum is the name given to the preparation described in this article in the same way that tuberculin is applied to those proteid derivatives of the tubercle bacillus with which we are familiar. Mycoleum indicates a fatty or oily preparation from organisms of the genus mycobacteraceae, or the acid fasts, to which belong the tubercle bacillus leprosy bacillus and many saphrophytes widely distributed throughout the world.

THE WALDORF ASTORIA.

LONDON LETTER.

*(From our own correspondent.)**Problems of Parenthood.—Venereal Disease.—Clinics and Professional Secrecy.*

LONDON, May 22, 1920.

A second report of the National Birth Rate Commission has been issued recently in book form. The commission was instituted in October, 1913, by the British National Council of Public Morals, and its first report, which has been referred to in this correspondence, and in which the causes and effects of the declining birth rate were amply and frankly discussed, was published in 1916. The book had a wide circulation and was popular, in that, it was generally recognized that its contents were extremely valuable, and the demand was persistently made from numerous quarters that in view of the fact that the great war had exerted much influence upon vital problems of population, the commission should pursue its work. The commission was reconstituted, its members being drawn from various classes of the community. Among the many well known and eminent men and women who gave evidence before the commission may be mentioned the following: Professor A. Keith, Dr. Amand Routh, Dr. Mary Gordon, Inspector of Prisons, Mr. Sidney Webb, Mr. Bramwell Booth, Major Leonard Darwin, Sir A. Conan Doyle, Sir William Osler, Sir H. Bryan Donkin, Dr. C. W. Saleeby, Dr. C. B. Turner, Dr. Marie Stopes, Sir Rider Haggard, Professor Leonard Hill, and Mr. Harold Cox.

In the first place the commission discussed the fall in the birth rate during the war years, the reduction amounting, in 1918, to twenty-six per cent., in England and Wales. They estimate that in the period 1915-18 the loss of births attributable to the war was 543,000. In commenting upon voluntary restriction, which is denominated as one of the most important causes of the decline in the birth rate, the commission states: "At present the decline of the birth rate is greater where the quality of the children might be expected to be better. The childbearing is at present relatively the greatest among families and in homes in which the economic and social conditions do not allow of the healthy and proper upbringing of so many children. The reduction is taking place in the average size of the families, in always greater degrees in those classes where the condition for the welfare and education of the children are the best. This disproportion in relative birth rates is an ominous sign for the future of the nation and the Empire. The duty of parenthood needs to be urged upon the well-to-do, who can provide the more favorable conditions for the bringing up of a family. The commission points out that the responsibility of the country to parents in the discharge of their obligations must equally be asserted. If the community desires an adequate number of children of good quality, its members must be prepared to see that the burdens which weigh too heavily upon many parents are relieved. Among the reforms which have been proposed are: Proper housing, a living wage, training for and care of motherhood and infancy, facilities for edu-

cation, and relief from taxation proportionate to the responsibilities involved. The need for a properly regulated redistribution of the population of the sexes in the Empire may be mentioned as one of the most important methods of relieving the burden of parenthood in large families. Various schemes for the endowment of motherhood were considered, but having regard to the economic and other difficulties of the question, the commission did not recommend any of them for adoption.

As for the problem of illegitimacy, to which reference has been made in a previous letter, the commission found that, although the decline in legitimate births had alarmed the country, and the illegitimate child has come to be regarded as helping to make up for the deficiency of births in wedlock, there is no evidence that public opinion has, as a whole, undergone any fundamental change of attitude toward the unmarried mother, nor are there any signs of such a change coming about in the near future. Statistics for 1918 show that illegitimate births had increased by 11.6 per cent. while legitimate births have decreased by 1.6 per cent. As a result of these changes the proportion of illegitimate to total births, which fell to a minimum of 3.95 per cent. in 1901-05, has now risen to 6.26 per cent., the highest ratio reached during the past fifty years. The commission drew attention to the fact that by no means the least of the reasons for regarding the illegitimate child as a national problem are these: a, The number of illegitimates shows no sign of decreasing; b, the mortality among illegitimate is double that of legitimately born children; c, the nation cannot acquiesce in the destruction of children, legitimate or illegitimate. The neglect and ill nourishment of the unmarried mother and her child tend to increase prostitution, poverty, crime and disease and are a source of continual recruitment of the undesirable class by potentially worthy citizens. Summing up the national and international aspects of restriction the commission said: "Grave issues for the nation and the Empire are involved in the steady decline of the birth rate. In the event of a war similar to that just experienced, what would happen to us with a greatly reduced birth rate? As it is, the position is most disquieting, both here and there, for the indications are that in the homeland the population may not continue to increase, while in the Dominions oversea, without the aid of immigration, it will not, at the present rate, increase greatly, at least from additions of the British stock. All these enormous lands, with their countless native races, we hold with less than 60,000,000 white people, of whom 45,000,000 dwell in these little islands. But unless we add to our numbers how long shall we be able to fulfill our obligations in the face of recent developments of race ambitions? Extensive settlement upon the land would mitigate the evil, but modern men and women will not settle in numbers on the land. As our experience and that of Australia show, they prefer the city and the cinema. The commission pointed out that the outcome rested largely upon the women as having votes they now held the balance of power.

(To be continued)

Editorial Notes and Comments

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NEW YORK, SATURDAY, JULY 24, 1920.

OUR NEIGHBORS.

Bernard Shaw once made the remark that we should not be concerned about the bodily cleanliness of our neighbors. He said that we did not see their bodies, and went on to say, reasoning in the same fashion, that they should keep their faces clean. Popular wits often get to the heart of things, but just as frequently, by making the surface attractive, they keep away from the vital spots. So it may be well to stop and analyze and not be misled by our own silly laughter.

Epidemics have shown us that once disease is started in a lowly, filthy quarter it spreads like a prairie fire and sweeps everything before it. In most instances the mortality rates in epidemics are as high among the rich as among the poor; among the clean as among the dirty. We know that the majority of people do not realize the value of personal cleanliness and hygiene. The proportion of those ignorant in these matters in our own country is not as great as in many other countries. We must be interested in the cleanliness of our neighbors in order to protect ourselves. We must spread our knowledge so that the less informed may be better educated. As a matter of selfpreservation we have the right to enforce measures of sanitation among our neighbors.

With the advent of rapid means of communication, the airplane, fast ocean steamships, and the many links that are forged by international commerce and free-for-all wars, the inhabitants of the most remote quarters of the globe are brought to our

own firesides. These people have become our neighbors, though we may never see them. And so we have the right to guide the education and look after the health of the Senegalese, the Eskimo, the African natives; they are all our neighbors.

Health Commissioner Royal S. Copeland has returned from Europe with a report of the sanitary conditions there. He tells how travelers returning from a holy journey to Mecca filter through Persia and, passing up the Russian rivers, carry cholera to Russia and Poland; and how, through the Baltic ports the disease may eventually reach the rest of Europe and even America, unless we are watchful. He states that typhus is prevalent in Poland, Russia, Ukrainia, Lithuania, Rumania, and Hungary. Filtration plants have been destroyed, water supplies are contaminated, sewage systems are blocked. Plague is found in Egypt and adjoining countries.

It is not alone our duty to watch our ports to protect ourselves. Disease can not be combatted effectually in this way. We need only recall the influenza epidemic. There was not a remote nook in the entire world that was not reached by this disease. We should do everything in our power to clean up the dirty corners of the world. Through the bait of commerce we cleaned the Panama Canal. A good example. Why should we not extend this work to the more remote regions, for the people there are our neighbors. We owe it to ourselves, to protect ourselves. We shall not make this an issue of altruism and pretend we are doing our neighbors a good turn, even if this is true. The cleanliness of our neighbors is a vital affair to us, and the wit of Shaw will not help them in maintaining their privacy.

STERILITY IN THE FEMALE FROM GONORRHEAL INFECTION.

There are two types of sterility of uterine origin in the female, the septic form which is the most serious and frequent, and that due to a mechanical cause which is far less serious. The most important of the septic uterine sterilities is unquestionably gonorrhoeal infection, giving rise to metritis, usually of the corpus uteri. From here the process may follow an ascending extension, invading the tubes and periuterine cellular tissue. In some rare cases a virulent infection may result in rapid invasion of the uterine mucosa, adnexa, and peritoneum with rapidly occurring suppuration in all these structures. In cases where uterine and periuterine lesions exist simultaneously the explanation of sterility is

simple, but the same cannot be said when the infection is localized to the cervix. It is, however, certain that a gonorrheal cervical endometritis is one of the most frequent causes of sterility as is proved by proper treatment of this lesion, the woman becoming pregnant afterwards.

The puffing up of the cervical mucosa, the morbid changes undergone by the mucosa of the corpus uteri and purulent secretions prevent the spermatozoon from progressing upward. It is either arrested by a collection of secretions which forms a mucopurulent plug or is destroyed by the too great acidity of the discharge or the toxin it contains. It is probable that some importance must be attached to slight tubal reactions that are usually unrecognized. Clinically gonorrheal metritis is met with in three forms, viz., acute, subacute, and chronic, the latter being by far the most common cause of sterility. During the first year of married life the woman presents a leucorrhœa resisting all kinds of treatment, resulting from an old gonorrheal infection in the husband. The process in the wife develops quietly, without giving rise to any general reaction or pain. The discharge is free, composed of thick, sticky, yellow mucus. The body of the uterus is normal in size, the cervix enlarged, swollen at its middle portion and with an os surrounded by a red cuff formed by entropion of the cervical mucosa through which a large drop of pus will be seen exuding. But even when the corpus uteri is infected the lesions are always more pronounced in the cervix and becoming localized are difficult to overcome.

The gonococcus is not likely to show itself very much. Hidden in the folds of the mucosa, or lodged within it, the organism does not appear in the pathological secretions excepting at the advent of the menses. Completely sheltered in the recesses of the mucous membrane or in its glandular structures, the organism produces a progressive increase in the size of the cervix, an increase and occlusion of the glands, thickening on account of the development of sclerous periglandular bands and, when it comes forth from its lair, the result will be a reinoculation which clinically is made manifest by an unlooked-for relapse and a contamination of the husband, who tardily receives the results of his own work. Hence a vicious circle is established in which a marital gonorrheal infection passed on to the wife is, at the exit of the gonococcus, transferred to the husband.

Treatment is purely medical and above all should be mild. Nothing but prudent intracervical applications should be attempted. Under no pretext should a sound or curette be resorted to unless an experimental inoculation of the mucosa of the corpus uteri is desired. When the infection is of long standing

and the applications are insufficient, it will be necessary, in order to overcome the infection completely, to deal radically with the diseased structures by cauterization which is renewed every ten or twelve days. Usually, when properly done, from four to five treatments are enough. During the treatment the mucopurulent discharge will increase in intensity, but from one treatment to the next the diseased structures will be seen to become eliminated, the cervix gradually assuming its normal aspect and color, and pus no longer coming from the external os. Cure is usually complete if the patient does not receive a reinoculation and if, during the treatment, she remains recumbent the greater part of the time.

THE COLLOIDS IN GENERAL PRACTICE.

Colloidal therapy has progressed apace and a belief in its virtues appears to be based upon a sound foundation. However, it is well to remember that, although the use of colloids was introduced many years ago, colloidal therapy is really in its infancy. The average general practitioner as a matter of fact knows little concerning the colloids, and reading and hearing of successful treatment by this method of administering medicine is likely to be led astray. He is prone to believe that all colloidal preparations have an equal or similar therapeutic value, whereas this is far from the truth, and acted upon will produce very unsatisfactory results.

As pointed out in the *Prescriber*, June, 1920, the preparation of colloids is, in many instances, no very difficult matter; the difficulty begins in the attempt to make them therapeutically valuable. The general practitioner should satisfy himself that he is using colloids of the right strength, those whose therapeutic properties are sufficiently known, and those which are suitable for internal administration, orally or by intravenous injection as the case may be. Further, the colloidal preparation used must be stable, that is, "protected," for if it is not it is no longer colloidal and its therapeutic value vanishes. Also the preparation must be fresh, the colloidal state being obviously essentially unstable and subject to disintegration by certain substances existing in the atmosphere.

Provided that all these principles are complied with, it is argued by the advocates of colloidal therapy, that it is easily the most effective method of employing medicinal measures in the treatment of certain diseases. Colloidal mercury may be given wherever the employment of mercury is indicated; in this state it is only feebly toxic and is rapidly absorbed. The other colloidal preparations, according to many who have tested them clinically, possess merits of a like nature and in the case of collosol

manganese Mr. J. E. R. McDonagh, F. R. C. S., has recorded some remarkable results.

Perhaps it is too early as yet to attempt to place an estimate on the value of colloidal therapy. It will suffice to say that so far the results, on the whole, have been satisfactory and encourage the belief that there is a great future for this method of medication. It is necessary to state, however, that when employing colloidal therapy it is essential to use preparations which have been properly stabilized and are isotonic with the blood. Those which do not possess these characteristics are not only useless but may be dangerous.

LABOR, LUXURY AND THE SURGEON.

Most people would imagine that the condemnation of harmful luxuries by doctors would happen most frequently in the office with rich patients, but surgeons attached to large industries could tell that neither fines nor thought of others seems able to eradicate the love of finery. Three cases of finger or hand crushing have happened recently in laundries owing to rings being worn. The law decrees that all flatiron workers must be equipped with guards in front of the feed rolls to prevent the hands of feeders from being drawn into the rollers, and ringed fingers were found especially dangerous, yet nothing seems able to instill the idea of self preservation at the small cost of giving up some finery in work hours.

It is not only the girls but the men who sometimes put adornment before safety. Do they realize—just to give one instance—that the rim of a circular saw is moving at the rate of one to two miles a minute? Perhaps not, but the printed warnings against wearing rings or gloves are before their eyes. All the same, smashed fingers and hands appear with horrible frequency, and the public blame the employer for what was in reality contributory negligence on the part of the worker.

THE SEAPORT DOCTOR.

Psychology is preparing ever increasing tasks for doctors, not intentionally, but she is working with medicine concerning the permitted entry of aliens into America, says the *Journal of Applied Psychology*, March, 1920, proving that a sound industrial democracy must be built on racial psychology and putting the right man in the right place. We notice the French Canadians drifting to the cotton factories, copper mining, smelting and leather works; Croatians toward the mines, steel and kindred trades; Danes favoring leather and furniture factories; Armenians, cigarette making and peddling; Greeks liking blacksmithing, baking, shoemaking; Hebrews get into small manufactures of the sweat shop variety. The Chinese love to import; the French Swiss take to hotel and restaurant business, silk industries, embroideries, etc. There are also the big questions of nostalgia and the adaptability to

climatic conditions. Truly the life of the doctor in a seaport city will not be attractive until civic governments, local boards and employers understand the nature and cost of that which they demand in the way of careful judgment concerning incoming workers.

News Items.

Fund for Spanish Hospital.—The will of the late Mrs. Luisa de Navarro, of New York, leaves the greater portion of her estate to establish a hospital in New York for Spanish speaking peoples.

Medicine in Holland.—The Dutch medical correspondent of the *Presse médicale* comments on the unity of organization among Dutch physicians. Of 3,300 medical men in Holland, 3,200 are members of the Society of Medicine.

Northwestern University Buildings.—The schools of medicine, dentistry, commerce, and law of Northwestern University will be housed in new buildings which are to be erected at Chicago Avenue and Lake Shore Drive, Chicago.

Bequest to Bowdoin Medical School.—Dr. Addison S. Thayer, dean of Bowdoin Medical School, Brunswick, Me., announces that the late Dr. Frank Byron Brown, of Boston, of the class of '87, has bequeathed to the school \$1,000.

Police Hospital Fund Campaign.—A campaign for \$5,000,000 for a police hospital for New York City is under consideration by a committee interested in the project. The proposed hospital, which will have 300 beds, will probably be located in Brooklyn.

Dr. Carrel Honored.—An honorary degree was conferred on Dr. Alexis Carrel, of the Rockefeller Institute, by Brown University, at its recent commencement. He also received the honorary degree of doctor of science from Princeton University at the recent annual commencement.

Vacancies on the Staff of the Psychiatric Institute.—The New York State Civil Service Commission announces examinations to be held on July 31st to fill the following positions at the Psychiatric Institute, Ward's Island, New York, of which Dr. George H. Kirby is director; assistant in neuropathology, \$2,160; associate in bacteriology, \$2,360; associate in internal medicine and clinical pathology, \$2,360; senior physician, \$2,000. Applications must be received at the office of the commission on or before July 26th.

Health Commissioner Copeland Returns.—Dr. Royal S. Copeland, health commissioner of New York, has returned from a trip abroad to attend the International Housing Conference in London and the Royal Institute of Public Health Conference in Brussels. In a published interview following his arrival, Dr. Copeland gave it as his opinion that in the protection of the milk supply, food inspection, health supervision, infant welfare, school inspection, and protection of the public against disease, New York is superior to European cities, but that Europe has much to teach us in the matter of garbage disposal, and also that in Europe the question of housing is regarded from the viewpoint of a public utility.

Sonsonate Cleared of Yellow Fever.—The quarantine against the city of Sonsonate, in the southwestern part of San Salvador, has been lifted, and Dr. Bailey, of the Rockefeller Institute, has informed the Committee on Public Health that yellow fever has been eradicated there.

Smallpox in Glasgow.—Smallpox is still reported as being epidemic in Glasgow. The disease, however, does not appear to be spreading with any increase of rapidity, as the number of new cases remains about the same—four to six a day. Since its commencement the epidemic has been almost entirely confined to Glasgow.

Death of Professor Kretz.—Professor Kretz, one of the last living pupils of Kunderat, died recently in Vienna after a protracted illness. He was born in 1865, and after studying in Vienna, became the professor of pathological anatomy in Prague and later in Würzburg. His investigations were directed to the physiology and pathology of the liver, and dealt also with diphtheria and sero-therapeutics. His papers on antibodies and immunity, on disturbances of metabolism and the pancreas, as well as on embolism of the lung, are most instructive and afford a clear insight into the problems of these conditions.

Cambridge Honors Medical Men.—At the annual meeting of the British Medical Association at Cambridge, the honorary degree of LL.D. was conferred upon the following gentlemen: Sir Clifford Allbutt, regius professor of physic in the University and president of the British Medical Association; M. Jules Bordet, president of the Faculty of Medicine and director of the Pasteur Institute at Brussels; Dr. Simon Flexner, director of the Rockefeller Laboratories; Dr. Pietro Giacosa, professor of experimental pharmacology at the University of Turin; Sir George Makins, president of the Royal College of Surgeons of England; and Sir Norman Moore, president of the Royal College of Physicians of London.

Examination for Associate in Psychiatry and Psychotherapy.—The United States Civil Service Commission announces an examination on August 24th for associate in clinical psychiatry and psychotherapy, from which a vacancy at Saint Elizabeth's Hospital, Washington, D. C., at \$2,500 a year and maintenance will be filled. The appointee will act as consultant to the different medical services of the hospital, and instruct the younger members of the staff in psychological methods and in the technic of case analysis and presentation. He will undertake analytical and therapeutic measures in special functional cases and will be expected to avail himself of the clinical material and laboratory opportunities for special observation and research. It is desired to secure the services of a person familiar with the modern therapeutic movements in the practice of mental medicine, particularly those that have to do with functional conditions and involve the application of psychotherapeutic principles.

A bachelor's degree and an M. D. degree or its equivalent from institutions of recognized standing, at least one year's resident hospital experience, and at least three years' experience in the care and treatment of the insane are required.

Otorhinolaryngologists Meet.—At the annual meeting of the American Laryngological, Rhinological and Otological Society, which was held June 2nd to 4th in Boston, the following officers were elected: president, Dr. Lee Wallace Dean, of Iowa City; vice-presidents, Dr. Harmon Smith, of New York; Dr. Joseph C. Beck, of Chicago; Dr. Joseph B. Greene, of Asheville, N. C.; Dr. William V. Mullin, of Colorado Springs, Colo., and Dr. Hill Hastings, of Los Angeles; secretary, Dr. William H. Haskin, of New York; treasurer, Dr. Ewing W. Day, of Pittsburgh.

New Jersey Medical Meeting.—The Medical Society of New Jersey held its annual meeting June 16th to 19th at Spring Lake, under the presidency of Dr. Gordon K. Dickinson, of Jersey City. The following officers were elected: president, Dr. Philander A. Harris, of Paterson; vice-presidents, Dr. Henry B. Costill, of Trenton; Dr. James Hunter, Jr., of Westville; Dr. Wells P. Eagleton, of Newark; corresponding secretary, Dr. Harry A. Stout, Wenonah (reelected); recording secretary, Dr. William J. Chandler, of South Orange (reelected); treasurer, Dr. Archibald Mercer, of Newark. The next meeting will be in Atlantic City.

Annual Meeting of the Public Health Association.—The American Public Health Association will meet in San Francisco, Cal., September 13th to 17th. Special cars will leave Boston and New York on Tuesday, September 7th, connecting with a special train leaving Chicago on September 8th. The program will include the following: A symposium on the relative functions of official and nonofficial health organizations; Western health problems; narcotic control; food poisoning; organization for child hygiene; mental hygiene; health centres. The foregoing subjects and others will be distributed among the following ten sectional groups: General sessions, public health administration, laboratory, vital statistics, sociological, sanitary engineering, industrial hygiene, food and drugs, personal hygiene, and child hygiene. Detailed information may be obtained from the secretary of the association, Dr. A. W. Hedrich, 169 Massachusetts Avenue, Boston.

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DIED.

BUCHANAN.—In Toms River, N. J., on Tuesday, July 13th, Dr. Thomas J. Buchanan, aged sixty-one years.

ELLINGWOOD.—In Pasadena, Cal., on Sunday, July 4th, Dr. Finley Ellingwood, of Evanston, Ill., aged sixty-eight years.

GUINNOCK.—In Philadelphia, Pa., on Friday, July 9th, Dr. William H. Guinnock, aged forty-two years.

HIRSCHFELDER.—In San Francisco, Cal., on Saturday, July 3rd, Dr. Joseph Oakland Hirschfelder, aged sixty-six years.

MACGRATH.—In Quincy, Mass., on Sunday, July 4th, Dr. Thomas H. MacGrath, aged seventy-three years.

PARKER.—In Springfield, Mass., on Thursday, July 8th, Dr. Ernest K. Parker.

PELHAM.—In New York, N. Y., on Friday, July 16th, Dr. Mathilde Annette Pelham, aged fifty-six years.

ROBINSSON.—In Alaska, on Sunday, June 27th, Dr. J. T. Robinson, of Columbia Falls, Mont.

STEELY.—In Pocatello, Idaho, on Sunday, June 27th, Dr. Oscar B. Steely, aged fifty-eight years.

Book Reviews

DISCOVERED BY THE CENSOR.

The Cream of the Jest. By JAMES BRANCH CABELL. New York: Robert M. McBride & Co., 1920. Pp. ix-280.

Beyond Life. By JAMES BRANCH CABELL. New York: Robert M. McBride & Co., 1920.

These strange seekers of impurity who from time to time tell us what we should not read, deserve much credit. Not that they tell us what we should read or suggest that we read at all for that matter, but this time they have discovered an American writer who has spoken too freely of things that they insist should remain unsaid. And so the censor has finally proved his value, for he has rendered a service to those of us who managed to secure a copy of the much discussed *Jurgen*. This led on to the discovery of the other books of this young, yet prolific writer. It was with amazement that we found ourselves deeply buried in the master works of American literature.

Slowly, reluctantly, the critics, in spite of their good training, have come to acknowledge Cabell as one of the really great writers of the present day. They attempted to trace back to their source the singing lines of subtle phantasy and a galaxy of writers from Voltaire to Shaw have been assigned as the foster parent. For if credit were to be given an ancestor should be found, for even critics seek legitimacy. And so they took the opportunity of showing their erudition and all the really good books they had read. Meredith, Anatole France and a host of others were given due credit. But why stop by the wayside and discuss the critics? Cabell does this very thoroughly in *Beyond Life*. Without attempting an analysis one can discern a varicolored literary background in the work of this newly discovered American genius.

His earlier works, charming creations of phantasy, yet built on a solid conscious foundation, send the mind scampering back to the historical and literary works of the time of chivalry and gallantry, and prove to us that he has made use of much that we have forgotten. Here, too, we find a promise of what is to come, and indeed they are a fitting prologue to his greater works, *The Cream of the Jest* and *Jurgen*. One immediately forgets the ornate trappings of the holiday editions of Harper's and spends refreshing hours with the charming figures created by Cabell. *The Line of Love*, *Chivalry* and *Gallantry* comprise this series. These tales are fittingly dedicated to that kindly old lady Mrs. Grundy. He probably had his early childhood difficulties with her and had the feeling that he should at least be polite to her, even if, in his maturity, he has discovered her not to be a kindly old lady but a blatant humbug.

When Cabell becomes critic, as he does in *Beyond Life*, he for the first time lays himself open to criticism. While the book is one of the keenest observations on literature and a masterly defense of the use of phantasy in fiction, he attempts to rationalize his method of procedure by proving that true literature should be about things as they should be and not about things as they are. If he would only

go a step farther and show that the phantasies of man, whether they are the myths of the people, the tales in the *Bible*, or the legends that have been handed down in the folk tales for generations and lost in the mists of antiquity, are only the wishes that man has symbolized because he has not been able to bring them into being in the world of reality. To defend these as the ultimate goal of literature is only defending human weakness. True, man in the past has grown by being an ape to his dreams, but the process has been one of a blind groping in a little understood world—the unconscious. Now that we can explore this world and bring it into the world of reality, a tangible, useful thing, how much more rapid should our progress be. The magic worlds woven by the unconscious to satisfy the censor will always remain a source of supply for the poet and creator of literature, but by the very act of his bringing them to us he enters into the world of reality, and we go a step ahead, understanding their creations better, and yet never losing sight of their beauty; indeed they will have a new charm, for then they will be both music and food to us.

It may all be true that realism is not art. Be that as it may, whether we agree or not is small matter, but we have often seen that reality graphically portrayed frequently causes changes by which things became more nearly what they should be instead of what they were. We might mention Harriet Beecher Stowe's *Uncle Tom's Cabin* or Upton Sinclair's *Jungle*, or Chekhov's *Sakaline*, the story of Russia's Siberian prison camp.

After all Cabell's works need no apology nor his own adroit rationalization. They are quite capable of standing by themselves just as many other symbolic masterpieces have stood through the centuries. The question of realism we shall only bring up by alluding to a concrete example. In the *Bible*, which we are told by Cabell is a master work of phantasy and which he rightly chooses to find more easy of belief than many of the events in everyday life, we find the story of the betrayal of Christ by one named Judas. A Russian writer, Andreiff, has made bold and written the story of Judas Iscariot as he interpreted the character from the biblical version. The story of Andreiff may well be called nearer realism than that of the biblical version. His Judas lives and breathes, becomes a powerful character, an unforgettable man, and yet he is the dream Judas of Andreiff, a creature formed in his own unconscious, his interpretation of the symbolic Judas of the *Bible*. He is presented to our conscious minds for reinterpretation. This same sort of thing Cabell has done when he has woven together the dream stuff in his unconscious—the dream material he gathered from the world's myths and legends, regrouped them in a new symphony of phantasy and presented them to the cadence of a new music with a new rhythm. But all these dreams are, as he strives to tell us, a method of escape from the world of reality which he found sordid and uninviting. But always he returns from his world of phantasy and brings back his wanderings to the world of

reality from which there is no escape. He does this in the *Cream of the Jest* and again in *Jurgen*. The skill lies in his ability to do this and not create an anticlimax. Is it escape that he seeks in his journeys in the realm of phantasy and does he try to justify his retreat by pointing the utility of his wanderings? By recalling our ability to ape our dreams and so make progress? Or does he knowingly enter into this semisomnolent dream world in a conscious endeavor to find what his unconscious is creating, to bring it to us as a dream of what men should be instead of what they are? A little of both, perhaps.

In *Beyond Life* Cabell carelessly dismisses Russian literature as dull. Without doubt he made an unfortunate choice and selected examples from a limited field, for they more nearly present the things Cabell most earnestly pleads for. He defends symbolic writing and little realizes that many Russian writers also have their moments of retreat which are marked by the production of some of the finest symbolic productions known in literature. They too have found realism hard to face, and perhaps they are more justified in their complaint than those living in more fortunate surroundings. They had a censorship to face more powerful than the one that suppressed *Jurgen*. They were forced to resort to a subtle, somewhat conscious symbolization in their literature. We find Andreiff writing plays of power and flexibility of almost pure symbolism, such as *Savva*, *The Life of Man*, *The Black Maskers*. Checkhov has given us *Uncle Vanya* and *The Sea Gull* and other plays similar to those of Dunsany. We find Korolenko's phantasy tale, *Makar's Dream*, and Dostoievsky's *Dream of a Queer Fellow* and the dream tales in Tchernechevsky in his book on *What's To Be Done?* and then the story of Grigorovitch, *Karalin's Dream*. In all of these tales the authors make use of carefully worked out symbolisms to describe the world as it should be and not as it is. In spots they do come to earth, even as Cabell, and for the advantage of contrast tell of the world as it is. All these men, and a host of other writers, have handled symbolisms with an understanding that many psychological students of the present day find difficult to grasp. If Cabell had read as deeply of the Russian as he had of the French and English he would not so hastily bring up the issue, and he would not seek so vainly for the things he complains at not finding.

In his attempt to explain that true art is an escape from reality he proves that an understanding of reality is necessary to art. For it is only when we fail to face reality that we seek an escape in the world of phantasy. Here we can soar to our heart's delight and hurl our darts against the world we call distorted. We are likely to forget that if we did not carefully consider and appraise this world of reality and make our judgments after contact we could not fling our satirical darts with any degree of accuracy. In the continuous change occasioned by evolutionary processes and with the many interrelated complexities there are bound to be many maladjustments. These incongruities will always

serve as receptors for the art and criticism of the maladjusted. We will find at every turning these warriors, deriding the world as they find it, behind a shield of wit with their weapons of irony. They find the many weak spots without difficulty and so cover their own inferiorities. The compensatory process is obvious. But withal we owe them much, for with their sharpened wits they hold the mirror to our deficiencies. And so we owe a debt to the Molières, the Nietzsches and the Cabells. More successful beings blinded by the easy adjustments they have made—satisfied with the world they find no difficulty in facing—even for a mediocre existence—satiated with simple pastimes, fit in their flexible souls in an order that could well be improved.

So we find so-called psychologists busily branding as abnormal all those who do not conform—all those who rebel. Perhaps they are right, but these moulded pedagogues forget the debt they owe these malcontents in the world of science and literature. The very things these learned men hurl at the heads of the malcontents are the findings of predecessors of these same grumblers, for it is by the keen wits of the maladjusted that progress is made. Smug critics from their mediocre pathways, often by sheer force of number, bear down upon the seekers of change, for the majority find it more comfortable to conform, and so the conflict goes on. Many take up the popular cry against progress to gain popularity. They travel the easy pathway of conformity. We find these parrots in the pulpit and read them in the press, and then a new outburst from the maladjusted and a new series of popular cries.

So we hail Cabell and bid him sing on. We will try to follow his melodious lines and interpret as best we can the world as it should be—or as he thinks it should be. But we will always enjoy and be grateful for the things he has given us. We greet Cabell and place him in a field alone in English literature. A place of his own creation and far above any of his nearest contemporaries. For he is a true artist. Perhaps the censor may sometime have another surprise for us. He may discover another artist who will rival Cabell.

PRIMITIVE SOCIETY.

Primitive Society. By ROBERT H. LOWIE, Ph.D., Associate Curator of Anthropology, American Museum of Natural History. Author of *Culture and Ethnology*. New York: Boni and Liveright, 1920. Pp. v-463.

The luminousness of Dr. Lowie's study of social foundations is the more remarkable since he has undertaken so vast a subject. The social scheme of primitive races engages each student in a different fashion. But by far the majority limit themselves to a single phase, or when their range of interests happens to be wider, present a report which deteriorates into instances and observations. Tribal peculiarities and customs, privileges and taboos conspire to impress us with the social complexities surrounding the savage, yet the why and wherefore is nowhere touched upon. This Dr. Lowie does not seek to do either, in fact he feels that psychologists and Freudian students should keep their impious hands off the simple, untrammelled savage in their efforts at world analysis.

"(Freud) paints the subjective state of mother-in-law and son-in-law with the lurid colors that tinge our modern family life but are wholly lacking in the savage relationship," says Dr. Lowie, but he himself is still content to note that such peculiar antagonisms exist among the peoples he is studying and does not seek to explain traditions at least as complicated as our modern ones.

For the students of cultural history, for the lay reader who cares to read something a little different from the popular history or a heavy, scientific treatise on primitive man's eccentricities, and for all specialists in the study of human development, a textbook and inspiring guide is here offered. Dr. Lowie's concept of society is that of an interrelation between individuals and groups, therefore to him society is a living, moving whole, as vital as the living beings comprising it. The anatomical structure, marriage, the family, kinship and the sib, law at its very source, the club, caste, and government, all these he presents to us, embryos, as it were, of the social structure that we know today.

The time will come when the anthropologist will find that the material he has been classifying and pigeonholing has more than a historical value. When he begins to explore the human mind, primitive or modern, it is all the same, he will find his observations and stores of data strangely interpretive, not of cultural trends, borrowings of custom between tribes, but of psychic, universal growth. Then perhaps he will be able to tear down the statistics laden structure of modern anthropology and acknowledge himself ready to learn to construct from fundamental causes rather than to distribute his findings under convenient headings. Lowie is still distributing. But he at least believes in a society that is alive.

INSTRUMENTAL ORTHOPEDY.

De l'Orthopédie instrumentale. By Dr. GABRIEL BIDOU. Twenty Full Page Illustrations. Paris, France: The Orphan-Apprentice-School, 1919. Pp. x-132.

The secret of Dr. Bidou's instrumental orthopedy is coadaptation, cooperation, and a thorough knowledge of anatomy on the part of the orthopedist. Most frequently the disabled man has to adapt his whole anatomy to the new limb, often creating a contortion nonexistent before. By the aid of the arthrometer the aid becomes a normal part of the body and demands no extraordinary muscular exertion. He deprecates the use of any stock mechanism, for that which will help one man may be totally unfitted for another. The mechanic begins his work when the mechanical physiology has been thoroughly studied. Some psychology is necessary to earn the good will of the patient toward instrumental aid and to teach him to collaborate with the surgeon, to conquer inertia, persevere in spite of fatigue, and overcome mental apathy, because this resignation to impotency is itself a fault. He relies on compassion, help, from family or State, as on a crutch and no longer exerts himself. It is impossible to give evidence by words only. Let those who want to understand that which is a hopeful remedial attempt to scientifically help our disabled study the lucid book by Dr. Bidou.

BRITISH MEDICAL ASSOCIATION.

British Medical Association. Proceedings of Special Clinical and Scientific Meeting, London, April 8-11, 1919. London: The British Medical Association, 1919. Pp. vii-403.

The papers presented here are those of a special clinical and scientific meeting held by the British Medical Association April 8 to 11, 1919, in London, under the presidency of Sir Clifford Allbutt. The last of the customary general meetings had been in 1914, and after the armistice it was decided to hold a meeting with a smaller number of sections than usual and at an early date, so that foreign medical officers might attend before their return home. The material is given under three heads, medicine, surgery, and preventive medicine and pathology. Reports of discussions are included. There are two general addresses, one by Sir Clifford Allbutt on the New Birth of Medicine, and the other by Sir Cuthbert Wallace on the Rise of the Casualty Clearing Station. Various war records are appended.

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

GREEN RUST. By EDGAR WALLACE. Boston: Small, Maynard & Co. Pp. i-299.

THE PATHWAY OF ADVENTURE. By ROSS TYRRELL. New York: Alfred A. Knopf, 1920. Pp. vii-310.

THE PARADISE MYSTERY. By J. S. FLETCHER. New York: Alfred A. Knopf, 1920. Pp. ix-306.

FOLLOW THE LITTLE PICTURES! By ALAN GRAHAM. Boston: Little, Brown & Co., 1920. Pp. iii-299.

THE VANISHING MEN. By RICHARD WASHBURN CHILD. Author of *Velvet Black*, etc. New York: E. P. Dutton & Co. Pp. i-324.

WOMAN. By MAGDELEINE MARK. Introduction by HENRI BARBUSSE. Translated by ADELE SZOLD SELTZER. New York: Thomas Seltzer, 1920. Pp. vii-228.

SEX AND SOCIETY—STUDIES IN THE SOCIAL PSYCHOLOGY OF SEX. By WILLIAM I. THOMAS. Seventh Edition. Boston: Richard G. Badger. Pp. vii-325.

THE IVORY DISC. By PERCY JAMES BREBNER. Author of *A Gallant Lady*, *The Turbulent Duchess*, *The Little Grey Shoe*, etc. New York: Duffield & Co., 1920. Pp. iii-254.

THE MYSTERY IN THE RITSMORE. By WILLIAM JOHNSTON. With Illustrations by HAROLD JAMES CUE. Boston: Little, Brown & Co., 1920. Pp. i-293.

SANE SEX LIFE AND SANE SEX LIVING—SOME THINGS THAT ALL SANE PEOPLE OUGHT TO KNOW ABOUT SEX NATURE AND SEX FUNCTIONING; ITS PLACE IN THE ECONOMY OF LIFE, ITS PROPER TRAINING AND RIGHTEOUS EXERCISE. Also, *A Study of How to Cultivate and Practise the Art of Love, and How to Master the Science of Procreation.* By H. W. LONG, M.D., Captain, M. R. C. Boston: Richard G. Badger. Pp. xxii-151.

HELMETS AND BODY ARMOR IN MODERN WARFARE. By BASHFORD DEAN, Ph.D., Curator of Armor, Metropolitan Museum of Art, formerly Major of Ordnance, U. S. Army, in Charge of Armor Unit, Equipment Section, Engineering Division, Washington; formerly chariman of the Committee of Helmets and Body Armor, Engineering Division of the National Research Council. Illustrated. New Haven: Yale University Press. London: Oxford University Press, 1920. Pp. xxiii-325.

Practical Therapeutics and Preventive Medicine

A Compendium of Treatment and Prophylaxis, Original and Adapted

RECENT GLEANINGS IN DIPHTHERIA PROPHYLAXIS.

BY LOUIS T. DE M. SAJOUS, B. S., M. D.,
Philadelphia.

(Continued from page 917, Vol. CXI.)

What of the administration of antitoxin in an attempt to rid diphtheria carriers of their infection? The generally accepted view of the action of antitoxin is that it is limited to the neutralization of diphtheria toxin and that the remedy has no direct effect on the diphtheria bacilli themselves. Such being the case, antitoxin should be valueless in the treatment of carriers. Yet it has been noted, according to McCollom and Place, 1913, that chronic nasal diphtheria will often clear bacteriologically as soon as the existing slight toxin irritation has been eliminated through antitoxin administration. From personal experience I am not convinced that antitoxin is wholly useless in the treatment of the average carrier. Indeed, the impression has been gained that, in some instances at least, antitoxin administration even in small doses may result in some change in the morphological features of the organism and its removal from the group of highly virulent, culturally positive bacilli. If such is actually the case, antitoxin administration might be considered at least worth trying in troublesome carrier cases.

Again, attempts have been made to overcome the carrier state by awakening an active immunity in the carrier through injection of killed diphtheria bacilli or toxin. Thus, in 1912, Petruschky treated a small series of cases, including some convalescents from diphtheria, with injections of diphtheria bacilli killed by chloroform vapor. The majority of the cases soon became negative—in five to twenty-nine days—but in one instance negative cultures were obtained only after intermittent treatment occupying over a year.

In an attempt to overcome protracted carrier infection in diphtheria convalescents by inducing a further defensive reaction in the body tissues and fluids, Hewlett and Nankiwell, 1912, administered injections of diphtheria endotoxin, prepared by collecting a growth of virulent diphtheria bacilli from culture media, removing the toxin by washing the growth two or three times in sterile saline solution, grinding the bacterial mass in the presence of intense cold, and filtering the ground mass through a Berkefeld filter. The resulting filtrate, which contained the endotoxin, was then standardized by addition of sterile saline solution in such amount that the product contained from two to five milligrams of the endotoxin per mil of fluid. The most effective plan of administration, clinically, was found to be to give an initial dose of two milligrams of the endotoxin and, if the cultures remained positive for a week or ten days, to give another dose of five milligrams, to be repeated later if necessary. Of

twenty-four diphtheria carriers in whom this measure was applied, all showed improvement after one or more endotoxin injections. Many of these persons had continued to be carriers for a number of weeks or months after the acute attack of diphtheria. After the endotoxin injections the carrier infection ceased entirely in many cases, while among those in which complete success was not attained there was at least a reduction in the number of bacilli in all instances. Reaction following the injections was limited to some local redness and tenderness, and in one case only, malaise and an evanescent rise of temperature. The doses of the endotoxin administered to adults and children were the same. On the whole, it must be admitted that no completely satisfactory procedure for eliminating carrier infection has as yet been discovered.

In some instances the inconvenience of isolation rendered necessary by carrier infection may be cut short by the use of the guineapig test, performed to ascertain whether the germs continuously harbored in a given case are actually of high virulence or are of so low a grade as to constitute no menace to susceptible contacts. Where the guineapig into which the germs are injected fails to succumb, the infection is considered to be one of low virulence and isolation of the carrier no longer insisted upon.

Administration of immunizing doses of antitoxin to the house contacts in clinical diphtheria cases is generally considered an important step in prophylaxis. Although some authorities would limit such immunization to contacts in special institutions for children and in hospitals, and depend upon careful watching of the contacts for signs of incipient clinical diphtheria, to supply the necessary indications for early, curative antitoxin administration, the fact remains that in the average household such expert watching is impracticable, and proper prophylaxis imperatively requires antitoxin injection in the other members of the household, particularly children, and in less degree young adults. Although secondary cases of diphtheria in a household are not very common, they do occur, and by prophylactic immunization of the other members of the family the number of these cases can be very markedly reduced. Results from antitoxin immunization in hospitals and other institutions preclude all doubt as to its preventive value. Thus, McCollom and Place, 1913, note that before immunization was applied, outbreaks of diphtheria were very frequent among the young children in the Infants' Hospital, Boston, as well as among the nurses and nursery maids. In a number of years after the institution of immunization, on the other hand, but one case of diphtheria probably originating in the hospital, developed among the infant inmates; a number of nurses and nursery maids did contract diphtheria, but these were all comprised among those who had declined to be immunized. The same authors note that in another institution, in which scarlet fever patients

are cared for, antitoxin immunization brought about cessation of diphtheria outbreaks in the wards.

These represent typical instances of experience with antitoxin immunization, though some observers appear to have been less fortunate—possibly owing to the use of an inferior quality of antitoxin, insufficient dose, or certain unusual circumstances among the classes of patients immunized. Thus Markuson and Agopoff, 1911, reported disappointing results among 1,178 children suffering from measles, in whom antitoxin was given to prevent diphtheria. Brown, Allen, and Lupton, 1907, stated that among 129 tuberculous and forty-nine nontuberculous individuals to whom 400 immunizing doses of antitoxin had been given during an epidemic, four patients had developed diphtheria between the fourteenth and sixteenth days following the first antitoxin injection, and in one case four days and in another one day after a second injection. Blumenau, 1911, stated that among 348 children with measles or scarlet fever to each of whom two injections of 500 or 600 units of antitoxin had been given in nineteen, or 5.5 per cent., diphtheria had developed later, and the procedure of immunization had been changed to active immunization with diphtheria toxin.

(To be continued.)

Treatment of the Postmature Child.—Charles A. Reed (*Surgery, Gynecology and Obstetrics*, June, 1920) states that when diagnosis of maturity or postmaturity has been made it is too late to influence the size of the child by Prochownik's diet except in those rare cases of habitual postmaturity described by Moissard. Here perhaps the conditions could be anticipated. The principle of management must be based on the results of regular and painstaking examinations of the child with a merely subsidiary interest in the subjective history. If the child is mature and the pelvis not seriously contracted, several days or a week may be permitted to elapse, and then if Nature fails in her duty, a day should be set and the labor induced. The induction may be brought about easily, safely, and expeditiously by castor oil and quinine, or by the Voorhees bag, or by both. Castor oil and quinine are effective in possibly two cases out of five but the Voorhees bag is always highly dependable.

If the attendant has not been watchful or if through the weight of tradition he has allowed the child to become postmature, a careful revision of the pelvic diameters must be undertaken. This examination may show that the transit of the child through the maternal passages would be highly questionable and possibly accompanied by more than ordinary danger. In such a case the Cæsarean operation will suggest itself as the most conservative way of terminating the pregnancy. On the other hand if the delivery by the pelvic route seems feasible, even though difficult, labor may be induced by the bag with a reservation that if the natural powers are insufficient, delivery may be completed by version and extraction or forceps, depending on the conditions and preceded if necessary by pubiotomy. To foresee difficulties that impend and to anticipate them by proper and judicious means is called by rhetoricians a pro-

lapsus. To foresee the obstacles and dangers which attend and follow the birth of a large or postmature child and to avert them by intelligence and skill is good obstetrics. Unhappily or otherwise we all have an ingrained reluctance to intervene in the course of what is apparently a regularly advancing pregnancy. It is much easier to let the business slip along under the impression, born of our hopes rather than of our knowledge, that the problem may solve itself.

Letters to the Editors.

PHYSICIANS IN THE HALL OF FAME.

NEW YORK, July 6, 1920.

To the Editors:

You were good enough to publish my letter in reference to the election of the names of Morton, McDowell, and Sims to the Hall of Fame in your issue of June 26th. In my letter I stated that the election would take place on July 1st. I have since learned that the electors have until October 1st to make their decision, which gives all those who are interested time and opportunity to send their endorsement of all or any one of the candidates mentioned to the electors or to the Senate of the New York University.

Since the publication of my last letter I have received a number of requests to include in the list of America's immortals the great Benjamin Rush, whom Roswell Park in his *History of Medicine* calls "the most conspicuous medical character of the century." American internists will always hold Rush in grateful admiration as an acute observer of disease. His description of clinical phenomena is today as authentic as when published, and, of course, I am glad to include the founder of Rush Medical College among those of our profession who should have a place in the Hall of Fame.

S. ADOLPHUS KNOPF, M. D.

VENEREAL PROPHYLAXIS.

PENNSYLVANIA DEPARTMENT OF HEALTH,
HARRISBURG, June 19, 1920.

To the Editors:

A word of appreciation for the editorial on the venereal peril published in the June 12th issue of the NEW YORK MEDICAL JOURNAL. Notice is taken of the mention made of sixteen prophylaxis stations established by the Department of Health.

The Pennsylvania State Department of Health does not centre its activity in the matter of venereal prophylaxis upon stations where prophylaxis may be given but upon the individual prophylaxis package, which is, or should be, obtainable at all drug stores. The department puts its approval upon preparations which come up to specifications as regards bactericidal properties, nonirritative effects, contents of the tube, character of the container, etc. Letters have gone out to all druggists in the state asking them to keep in stock those preparations which come up to the requirements of the department. I wish to say that the prophylaxis stations are not doing much in this line of work.

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Director, Genitourinary Division.

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Original Communications

THE ANATOMICAL AND PHYSIOLOGICAL THEORIES OF PLATO.

BY JONATHAN WRIGHT, M. D.
Pleasantville, N. Y.

It is quite evident (8) that the Homeric Greeks entertained ideas in regard to the pneuma and the soul of man but little removed from the accounts travelers give of those of primitive man. Man was in relationship with his environment by virtue of it. His ideas were essentially pantheistic. It was the pneuma within the body which not only commanded its activities but translated its impressions. It played the part not only of the sensory nerves, but of the motor nerves as well. It went in and out of the body in respiration. In the phenomenon of death, it escaped permanently through the air passages or through any gaping wound of the body that let it out. What the Homeric idea of disease was cannot be exactly demonstrated. It was evidently to a large extent, one of demonology, evolving toward a differentiation which in the course of a few centuries almost entirely submerged the primitive etiology, for there is no demonology in Hippocrates. Herodotus (484-424 B. C.) was about twenty-five years old when Hippocrates was born (460 B. C.), according to commonly accepted chronology, and he said Homer lived about four hundred years before his time. Some of the Homeric poems are supposed to have been composed earlier than this, but we are perhaps not far wrong in allowing four centuries in which this striking change took place. Puccinotti (1) has written one of the most readable of all the histories of medicine. The prominence he gives to the Chiron School of Medicine from which Achilles and some other Homeric heroes graduated, and the still more vague emphasis he places on the University of Orpheus, more recent archeology has failed to justify.

Æsculapius may have had an honorary LL.D. of the former, for he sent his two sons to the Trojan War, not as warriors alone, but as physicians. One has to be a little cautious in seeing any affiliation of the doctrine of the pneuma with the deification of Æsculapius, to be inferred from a story of the traveler Pausanias (2) written in the latter part of the second century of our era, when the glories of ancient Greece were long since things of the past. He relates (VII, 23) that a Sidonian told him that at Tyre Æsculapius was worshipped as the symbol of air, because that element is the father

of health and Pausanias told him the same idea prevailed in Greece. This all may very well have been adapted from the then greatly expanded doctrine, springing from the faddist teachings of Diogenes Apollonius in the time of Hippocrates. In the verses of Orpheus, according to Aristotle (*On the Soul*) the soul is described as moved to and fro by the winds and it is drawn into the body in respiration, perhaps with the first inspiration after birth. Now we infer from Diogenes Laertius (3) that Orpheus was a barbarian and that those who believed that the knowledge of philosophy came to the Greeks from barbarians called him a philosopher. Diogenes calls him a barbarian because he was a Thracian, but Thrace sent forth many minstrels and prophets in the time of Homer and doubtless in the earlier time of the Trojan War. This is by no means the chief intimation we have of the external source of Greek theories, but despite the association of Pythagoras with Egyptians and other Asiatics we may imagine that as heir of Orphic religious enthusiasm he may have had from Orpheus the view he had of the Cosmos "always inhaling and exhaling infinite breath or void (ether) which surrounds it on every side."

We need not, however, seek in the baffling traditions of half mythical persons for the origin of such ideas. It was from the Asiatic Greeks, from the nature philosophers of Ionia and Caria, from Colophon and Miletus, from Cnidos and Cos and the islands that fringe the shores of the Asiatic littoral, in contact with the sea and land routes between Egypt and Asia Minor, over which commerce traveled, that history records Greek philosophy sprang. Xenophanes (flourished 536-496 B. C.) seems to have dissented from the view of Pythagoras (born 608 B. C.) and he is thought by Gomperz (6), with true Teutonic modesty ascribing the origin of the pneuma to the inventive minds of the skin clad barbarians of the Danube, to have received it undiluted from these or more northern Aryans. According to Xenophanes the soul returns to celestial space. A line of Epicharmus of Cos, a contemporary of Xenophanes, has been preserved to us, bearing the same sentiment, strangely modern in form: "Dust to dust and breath of Heaven."

This brings it direct to Cos, the birthplace of Hippocrates who was ten years old at the reported time of the death of Epicharmus (450 B. C.). Though it is first found surviving in the text of Herodotus, Xenophanes of Colophon is said to have

been the first to employ the word *pneuma* in this connection. We have Fuchs's (6) word for it that in Homer the substantive form is not used. Dar-emberg (7) though asserting the existence of the idea of the *pneuma* in Homer, which we have verified (8), supposes the word to have been derived from that which in Homer included a reference to both lungs and pleura. Anaximenes of Miletus must have belonged to this epoch also. The single fragment of his philosophy which has come down to us in his own words concerns us at once. "Just as our soul, being air, holds us together, so do breath and air encompass the whole world." (9) We might trace this doctrine through its modification into the *nous* by Anaxagoras, the pupil of Anaximenes, and to Athens through Diogenes Apollonius, who may have written the book on *The Winds* in the Hippocratic Corpus, where it is carried to absurdity.

In Plato the fire of Heraclitus, which in Aristotle became the vital heat, is worked into a wonderful cosmic theory with the air and water, which few can comprehend. Perhaps Plato took some of the obscurity of Heraclitus into this part of his writings, most of which are as clear as crystal. At any rate we get the trail from the nature philosophy of Anaximenes and Heraclitus, straight into the dark shadows of the *Timæus*, where we find the *pneuma* theory which was transmitted from this work of Plato, rather than from any genuine treatise of Hippocrates, into later medical literature. It flourished in the time of Hippocrates, but despite the easily found traces of nature philosophy which probably came through Alcmaeon and Empedocles, we get no distinct formulation of the *pneuma* idea in his genuine works and but little incidental indication that he was seriously influenced by it. For these reasons I for the present pass over the older Hippocrates to his younger contemporary Plato and the latter's great pupil, Aristotle. In Plato the fire still retains the mark of its protagonist, Heraclitus, and this part of his doctrine we may well associate with that of the Persian Zoroaster. According to Martin (10) Galen or the author of the tract on philosophy, usually incorporated in his works, and the ancient critics, Proclus, Chalcidius and others asserted the meaning of Plato was that the soul was incorporeal. Hence it had to be separated from the air. Unless that is the meaning of Plato's tendency to give prominence to the ether, I cannot see it in that light. The idea of the air as a corporeal body, perhaps only emphasized by the experiment of Empedocles and long admitted, was still invisible and mysterious. Later the stoics, especially Chrysippus, placed themselves firmly on the basis of primitive man and identified the soul with the air, claiming the support of Plato. In his view it was allied with fire and ether, one of which was grossly misconceived and the latter still is a theory. It seems to me that Plato nowhere frankly separates either the fire or the ether or the soul from the air. Rigid analysis had not become a habit of mind. There are passages in Plato which later philosophers were accustomed to read as though they refer to the corporeality, to the reality of the air. In

their time, doubtless they felt justified in excluding the soul from the congeries of conceptions still adherent to the air, but there is in Plato no clearly cut idea that it had nothing to do with the air. Galen (18) declares the *Timæus* was read only to a few friends capable of understanding it. He intimates that the pantheistic doctrine it contains was unknown to the common people and might offend them. Galen refers rather to this doctrine of the soul as puzzling than to Plato's remarkable conception of the animal body.

Importance in medicine was first given to the *pneuma* by Philistion of the Sicilian School (11). From him Plato may have derived his doctrines when he went to Sicily on his unfortunate errand as tutor of Dionysius II, though the *Timæus* and many of his earlier works may have been written before. Wellmann attributes to Diocles the first distinction made between arteries and veins, both carrying air as well as blood according to the view of the Sicilian School. For Diocles, younger than Hippocrates, and to a less extent for Plato, the *pneuma* disturbances were combined with disturbances in the equilibrium of the humors as the cause of disease. Thus early the humoral doctrines and those of the *pneuma* were combined in medical conceptions of etiology. Plato repeats the age old conception in the *Timæus* of the impressions on the body being distributed by the blood vessels, but it is not clear whether they are inherent in the blood or in the air mixed with it. The importance we ascribe to finding such a discrimination (12) is perhaps not very consistent since in modern times we see no difficulty in ascribing a lot of properties to the blood in serotherapy, without considering or without knowing in chemical terms just what formula represents any specific attribute.

To discuss further Plato's ideas in regard to the soul would involve the exertion of higher powers than my own. They receive an enormous expansion in his dialogues, taken as a whole, and libraries of books have subsequently been filled with comments on them. I must confine myself to the bearing these ideas have upon the *pneuma* chiefly in its relation to the conceptions of the anatomy of his time and briefly in its influence on the succeeding epochs in physiological science. I may make an exception to this limitation by briefly alluding to the threefold partition of the soul—the noble cogitations of the intellect being seated in the brain, a relic of the ancient doctrine of Alcmaeon, the noble emotions in the heart and the animal appetites and passions in the abdomen between the diaphragm and the navel. We see thus the multiple souls of the primitive African philosophers finding in the human frame a separate habitation. It was into Sicily years before Plato and two thousand years after him that Africa continued to pour, by invasion and by commerce, her hordes from Carthage and the neighboring shores of her Mediterranean coasts. Plato is said to have traded with Egypt in olive oil, as Solon did before him. I think I have shown (13) that we have sufficiently clear evidence in the Papyrus Ebers that *pneuma* ideas dominate its anatomy and physiology,

and I have elsewhere (14) cited at some length from the copious evidence ethnology offers of the widespread belief in multiple souls by primitive people. This is especially abundant in savage Africa in modern times. With these primitive conceptions of the soul we find, added to that of the pneuma from Egypt, Plato's obligations to Heraclitus for the Asiatic theories of fire and perhaps of the ether, the former finally evolving into a form, that of heat, which in Aristotle allies it more definitely with the principles of modern science. These facts stand forth, thanks to the labors of many commentators, ancient and modern, in an attentive study of the *Timæus*. This book has baffled the most skillful of translators and the most profound of critics. Perhaps its obscurity is one reason for the influence it had on the subsequent evolution of medicine. The literature¹ which has grown up around the *Timæus* has displayed the unequalled scope and power of the imagination of Plato.

No imagination is purely imaginary. Every castle in Spain has its foundation in the solid facts of real life. Every dream, we are told by those not devoid of an ill controlled imagination themselves, has its root in the impressions made on the mind by the senses of men when awake. We may be sure that Plato did not evolve from his inner consciousness alone that fantastic idea of anatomy and physiology in those parts exhibiting the involvement of the pneuma, set forth in the *Timæus*, to which I can scarcely do more than allude. Cicero's far less profound mind adopted much of it in his essay on the *Nature of the Gods* (Lib. II, 54-56), and it is there somewhat incompletely but more clearly set forth. Professor Jowett conferred a great benefit on medicine by opening to modern readers the dialogues of Plato in an English translation. Of this Sir William Osler (15) took advantage many years ago in order to offer to the attention of medical men those points of medical interest which they contain. Unfortunately the brilliant performance of Jowett is obscured in the inadequate and often incoherent rendering of this part of the *Timæus*. Martin (10) is considerably more successful, but a comparison of either the English or the French interpretation with the Greek text will easily reveal an inexactitude which is not compensated for by their plausibility and which evidently arose from bewilderment in both translators, partly due doubtless to their insufficient acquaintance with the general outlines of human anatomy and physiology and the history of their evolution. Chiefly, however, one must realize it is due to the remarkable scope of Plato's thought and the wide expansion of his imagination. Possibly by approaching it from a viewpoint formed by a better knowledge of medicine and by a better understanding of the course of medical thought before and after Plato, the medical reader, despite

his vastly inferior philological knowledge, may arrive at a more satisfying if not a more accurate and technical understanding of Plato's thought.

In the spurious book on the *Aliment* we have seen (16) the idea existent, probably at least as early as Plato's years of activity, that the air is a food when inspired. We must bear in mind that however faulty the idea of the circulation of the blood was for the contemporaries of Plato and for those living nearly 2000 years after him, it did surge with the air through the veins and, for some, through the arteries. If the air is a food to the tissues it must get to them by channels at that time, undiscovered either in the lung or the system generally. No such mind as Plato's could rest satisfied with this gap of nutrition in the continuity of the ever changing flood of existence as conceived by Heraclitus. We may imagine that in the *Timæus* Plato followed the old Egyptian conception of channels (or metie) running everywhere through the body. We are able to help ourselves out with the lymph spaces and call them channels (or metie). But Plato had no such knowledge as we possess. What must have occurred to him was: "It seems evident that thus the nutrition and the life is carried throughout the body, but how does it reach the flesh lying between the vessels we see?" Plato therefore conceived of the life—of the air and fire (heat?) passing through the veins, but also God wove "together of fire and air like basket nets" [78]—a sort of reticular tissue we may call it for a moment in order to encourage modern anatomists. We shall find this tissue of Plato's imagination dissolving and flowing through itself. Modern histologists know of the cells wandering off from the walls of the lymph spaces, and know that it is a structure in which the constituents flow away and are replaced by others, the ever changing river of life, as old Heraclitus thought of it, which is never the same—"man never steps twice in the same river." I am not trying so much to force a parallel of things as to exhibit the underlying parallelism of thought between Platonic and modern mental concepts.

In the discourse of Plato we get a hint of this transmutation of tissue—of the flesh into liquid "which generates all sorts of bile and lymph and phlegm," in the process of disease. It is perhaps not necessary to use modern parlance in tracing the genesis of mucus and pus. Something happens in the retiform tissue; a blow, a foreign body, a bacterium, whose potentiality is so interesting to us, cause the network to break down into a fluid, which flows away along lymph channels if no surgeon is at hand. The pathological change as well as the physiological change which took place was thought of by Plato. "Now everyone can see whence diseases arise. There are four natures out of which the body is compacted—earth and fire and water and air, and the unnatural excess and defects of these, or the change of any of them from their own natural place into another, or again, the assumption on the part of these diverse natures of fire and the like of that which is not suitable to them, or anything of the sort, produces diseases

¹ Léon Robin has recently published an interesting study on the physics of Plato (*Études sur la signification et la place de la physique dans la philosophie de Platon*) which has come to my notice since this article has been written, but there seems to be little in it in regard to matters of our especial interest—nothing, I think, which I have failed at least to allude to here. I cannot, however, too highly recommend it to the students of physics proper in the *Timæus* and to lovers of Plato in general.

and disorders; for each being produced or changed in a manner contrary to nature, the elements which were previously cool grow warm, and those which were dry become moist, and the light becomes heavy, and the heavy light; all sorts of changes occur." I doubt if my readers will think it worth while to follow the thought in this, but it is little worse than the mist which hangs about the beginnings of bacteriology or serology. It is less difficult to seize the conclusion which is to be drawn from this picture of the processes in the living body, if one gets the drift of the thought of them through the mind of Plato and sees how out of it arises his discrimination of the pathological from the physiological. "For we affirm that only the same, in the same and like manner and proportion added or subtracted to or from the same, will allow the body to remain in the same state, whole and sound, and that, whatever is taken away or added in violation of these rules causes all manner of changes and infinite diseases and disorders."

Now this gives us a glimpse of the grasp Plato had of the many theories of the nature of man and his diseases prevalent in his day, which is a little aside from the subsidiary theme of the reticular tissue which has led us in sight of it. The modern reticular network like the Platonic has a need for renovation and repair. Everything wore out in his day as it does in our own. Everything now, as in the days of Heraclitus, is in a state of flux, but it is a proposition hard for us to grasp when, as we shall note, we realize that Plato made his air and fire framework to flow along the channels of the body to aid in vivifying and renewing it, somewhat as we make our wandering cells perform their functions. After Plato we find Erasistratus busy with the thought of the connective tissue. He it was who gave it, in the lungs, the name of parenchyma. I do not know if the cryptic sayings of Plato in the *Timæus* had their influence on him. As for the antecedents of Plato's own thought, no fact or fancy can be seized by the intellect of man which is unassociated with anything that is already familiar to him. The only previous hint in antiquity known to me of the body made as a network is derived from an incidental remark of Aristotle (*Generation of Animals* II, cap. 1) who says that the organs of an animal are generated either simultaneously or in successive order as described "in the verses of Orpheus. For it is there said that an animal is generated similarly to the knots of a net." I recognize that the thought of Aristotle is not in line with our present concern, but we get from Orpheus at least the simile of a fish basket or net. In Jowett's translation Plato proceeds thus in continuation of the sentence quoted above, as to a basket network of fire and air, having in mind perhaps a basket such as is used to capture lobsters or fish.

"The network he took and spread over the newly formed animal in the following manner: he let one of the openings pass into the mouth; this opening was twofold, and he let one part of it descend by the air pipes into the lungs, the other by the side of the air pipes into the belly. (The laryngo-

trachea and the esophagus). The other opening (the pharynx?) he divided into two parts, both of which he made to communicate with the channels of the nose, so that when there was no way through the mouth the streams of the mouth were replenished from the nostril. But the other cavity (?) of the network he placed around so much of the body as was hollow, and the entire receptacle which was composed of air he made to flow into the passage of the network, which then flowed back; the tissue of the lung found a way in and out of the pores of the body, and the rays of fire which were interlaced followed the passage of the air either way; this continuing as long as the mortal being holds together. These, as we affirm, are the phenomena which the imposer of names called respiration and expiration." We must pause to recollect that air is passing not alone into the arteries from the modern air passages, but the process includes the passage of air through the pores of the body, which not only channel it but, in the sense of Empedocles, pierce the integument and communicate with the outside air. "And all this process of cause and effect took place that the body might be watered and cooled, and thus have nourishment and life; for when the respiration is going in and out, and the fire (heat?), which follows at the same time, is moving to and fro, and entering through the belly, reaches the meat and drink, it liquefies them, and dividing them into small portions and guiding them through the passages where it goes, draws them as from a fountain into the channels or veins, and makes the stream of the veins flow through the body as through a conduit."

Reflecting on the vicissitudes of the text, passing through hands entirely unskilled and interpreted by minds entirely void of any idea of anatomy and physiology, we may easily conceive how such a passage may have become so mutilated as to be now almost undecipherable by the ablest of philologists and paleographers, but by keeping the central idea of the necessity for the interchange we now know goes on in the lymph channels, we get in hailing distance of Plato's thought. How are we going to account for the birth of this stupefying conception in the mind of Plato? The mind of Plato, we may grant, explains no inconsiderable part of it. Its fertility can be gauged only by reading all his dialogues. For many readers of this article this is an impracticable suggestion, but they can at least assume that he had a mind of exceptional imaginative power. As has already been pointed out no imagination is purely imaginary. It grows by what it feeds upon. So far as space admits, I have attempted to trace some connection between Plato and the thought of his time. He mentions Heraclitus and it is quite clear he was profoundly influenced by his philosophy. Burnet (9a) guided by Proclus, believes Plato knew nothing of Democritus and his atoms. He does not mention him, but one can scarcely believe he was not familiar with his doctrines. Since Aristophanes (17) in the *Clouds* refers to the *Vortex*, the atomic theory must have been familiar to the Athens of the days of Plato. The expression used by Empedocles to describe the movement of the

elements is that they run through each other (fr. 17-34).

The anatomy and physiology of Plato, whatever may have been the sources from which he drew his inspiration, were figments of his imagination. On it he drew for his mental pictures of the structure and forces of the body. The fire being an attenuated form of matter as compared to the coarser particles of air, he made his connective tissue out of them. The reason for the network was not only to permit air and fire and food to flow through the body but to permit the disengaged particles of air and fire to escape while the food and the drink [78 A], the chief nutrition of the body is retained. Their intimate relation to one another while in the body is made plain, the air being thought of as constituting the outer layers of the network and the fire or the heat the inner lining, presumably in contact with the digested food and drink, but their state of flux we recognize as greatly exaggerated in Plato's thought, evidently owing to the emphasis of Heraclitean doctrine. We see also in the mingling of the humors and the pneuma the trace of Sicilian medicine and we realize that like Diocles, Plato was not purely a pneumatist nor purely a humoralist, but admitting the equilibrium of the four elements as a state of health and its disturbance as disease in accord with Alcmaeon, he left the way open to conjecture that the cause of that disturbance of equilibrium might be sought in the pneuma.

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AN EPIDEMIC OF TYPHOID FEVER OF WATER BORNE ORIGIN AND CARRIER TRANSMISSION.

*At Camp Hospital No. 10, Prauthoy, Haute Marne,
American Expeditionary Forces, France.*

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On January 20, 1919, a case of clinical typhoid fever was discovered at Camp Hospital No. 10, located at Prauthoy, Haute Marne, France. The tenth area from which this hospital received its patients was occupied by the Eighty-second division and a few casual organizations. This patient was admitted on January 16th, and for the first few days the condition was diagnosed as bronchopneumonia. On January 24th a crop of rose spots appeared and on the following day a blood culture was taken. At that time the cultural bacteriology for Camp Hospital No. 10 was done at the central medical department laboratory at Dijon, France, a distance of some thirty kilometres. Within forty-eight hours, however, the clinical diagnosis was confirmed by a positive report of *Bacillus typhosus*.

The case originated in Battery E of the 321st Field Artillery and, as the number of men being hospitalized from that organization indicated a high sick rate, a careful watch was kept of all admissions from that command. To facilitate the early diagnosis of typhoid or paratyphoid fever a special building was designated as a gastroenteric ward. By the improvisation of temporary partitions this building was subdivided into sections for: 1, Clinical typhoid fever, 2, typhoid fever suspects, 3, typhoid carriers, and 4, other conditions such as gastritis, gastroenteritis, diarrhea, dysentery, acute catarrhal jaundice and acute cholecystitis. All enteric patients in the hospital were immediately collected here and all new admissions for such conditions were sent to this building for observation.

As a result of a conference between Major John W. Emhardt, commanding officer of the hospital, Major Victor C. Vaughan, Jr., epidemiologist from the division of laboratories and infectious diseases of the office of the chief surgeon, A. E. F., and the laboratory officer assigned to the hospital, the following hospital order was issued:

"A blood culture for typhoidlike organisms will be taken in the case of all typhoid suspects on admission. If negative two more blood cultures will be taken at the end of forty-eight and ninety-six hours respectively. A blood culture will then be taken every seven days throughout the illness, without regard to previous findings. An additional blood culture will be taken at the onset of a relapse. "In cases of fevers of an unknown origin three successive blood cultures will be taken at forty-eight hour intervals following admission to the hospital.

"Fecal cultures for typhoidlike organisms will

be made in all cases of typhoid suspects or fevers of unknown origin of forty-eight hours' duration and in such cases of gastrointestinal derangement as gastritis, gastroenteritis, diarrhea, dysentery, acute catarrhal jaundice, and acute catarrhal cholecystitis, with or without fever, when occurring in a command from which cases of typhoid fever have been reported. If cultures from any of the above mentioned gastrointestinal derangements from normal stools are negative a saline purge will be administered and a second culture will be made from the resulting movement.

"Patients in whose stools typhoid or typhoidlike organisms have been discovered will not be discharged from the hospital to a duty status until three successive negative fecal and urine cultures have been obtained, the same to be taken at weekly intervals.

"A quantitative Widal reaction will be determined at seven day intervals in each suspected and proved case of typhoid or paratyphoid fever."

This necessitated laboratory facilities beyond those possessed by the hospital at that time so a U. S. Army transportable laboratory equipment was requisitioned and immediately secured from the advance medical supply depot at Is-sur-Tille. A portion of one of the hospital buildings was taken over and divided into four small rooms. These were furnished with water, electricity and other equipment, and with the assistance of a sergeant of the medical department, who was a graduate pharmacist, and two trained technicians assigned from the central medical laboratory, the laboratory studies, under the direction of Captain Cornwall, were commenced. Later this laboratory personnel was increased by the assignment of Captain Crawford and four enlisted men, who had comprised the personnel of the Eighty-second divisional laboratory.

Before February 1, 1919, eleven patients had been admitted to the hospital from Battery E, 321st Field Artillery with either clearly marked or very suggestive clinical symptoms of typhoid fever. On February 3rd, two more patients were admitted, on the 7th one, on the 9th two, on the 14th one, and on the 15th one, making a total of eighteen cases of clinical typhoid fever from the same organization within a month.

EPIDEMIOLOGY.

Investigation for the purpose of ascertaining the possible source of the epidemic lead first to an inquiry as to the movements of the organization before it reached the area. It had come from the Argonne region with the other units of the Eighty-second division and had arrived in the tenth area on December 19, 1918. While in the Argonne there had been a considerable amount of diarrhea among the members of the command but no cases of typhoid fever. The absence of typhoid in the other batteries of the regiment and in the other units of the division, together with the interval that elapsed after leaving the Argonne before the appearance of the first case, seemed to render it improbable that the infection had been brought from there.

CIVILIAN POPULATION.

Battery E was billeted in Rosoy, a small French town of 400 to 500 inhabitants. The sanitary conditions of the town were fair and the billets as good as the average. According to information obtained from the French civilian physician there had been an epidemic of typhoid fever in this town ten years previously. This epidemic comprised about sixty cases; sixteen of the patients died and were buried on the hillside overlooking the town. The assurance was given that there had been no typhoid in the vicinity for at least two years but this information was later negatived by the discovery by Captain Crawford, during the first week in February, of a case of clinical typhoid fever in a young French girl, at whose home a cook and two other men from Battery E were billeted. The members of the kitchen force were accustomed to congregate frequently at this billet. A specimen of feces from this French girl was sent to the laboratory at Camp Hospital No. 10 and an organism isolated that, in its serological reactions, resembled the *Bacillus paratyphosus* B from which it was concluded that we were dealing with two disease entities that had no immediate relation to each other. More detailed study of this organism with different batches of diagnostic sera resulted in its identification as the *Bacillus typhosus*. The sugar reactions were confirmatory for typhoid rather than paratyphoid. None of the men billeted at the home of this French girl contracted typhoid. The onset of her illness, so far as could be determined, occurred about January 20th, which lead us to the conclusion that she was not the cause of the epidemic but more probably contracted the infection from the same source that the soldiers did or by contact.

FOOD.

All of the food was prepared at the same kitchen and consisted of issue rations with the exception of milk which was purchased locally and presumably boiled before use, although this was not confirmed to the satisfaction of the division sanitary inspector. Many of the men admitted that they had drunk unboiled milk after their arrival in the area. The cooks had been permanent but there had been a shifting kitchen police. French civilians assisted in handling the food when it was transferred from the ration truck to the kitchen. The meals were served from a low field range and it was customary to remove the covers of the food containers and stand them against the wall of an adjacent stone building while mess was served. The ease with which mud could be spattered upon these covers as the mess line passed and thence get into the food rendered this a dangerous procedure that was immediately remedied. Fruits and other edibles were on sale at the civilian stores in the neighborhood and probably some food from these sources was consumed by the soldiers. Green vegetables were not available at the market at this season of the year. Beer and wines, all of which were said to be grossly diluted with water, were on sale at several places. Members of the kitchen force admitted having purchased eggs and chickens

from outside sources for their own consumption. Orders were issued strictly prohibiting the purchase or consumption of food, wine, or beer from civilian sources.

KITCHEN AND LATRINE.

The kitchen was located but a short distance, fifty feet, from the battery latrine. Owing to the fact that soldiers, when not continually under surveillance, become negligent in their personal habits as to the use of latrines and the care of their hands after visiting the latrine this situation had in it an undesirable element of danger and consequently the kitchen was removed to another locality. This made more remote the possibility of fecal matter being tracked from the latrine to the neighborhood of the low field range where it could be easily spattered into the food.

WATER SUPPLY.

The town was supplied with water from two sources, both of which were brought in pipes from springs located some distance from the village. Although the bacteriological examinations of samples from both sources did not show either to be badly contaminated they had been labeled as non-potable and the men had been cautioned against using any but chlorinated water. Previous to the outbreak of typhoid the water had been chlorinated in the Lyster bags after they had been filled from the water carts. Men were observed to fill their canteens directly from the water carts, hence it was ordered that thereafter the chlorination should be done before the removal of any water from the carts. A cook was observed to dip water from the cart and then place the dipper on the muddy ground. This was remedied by having the dipper hung at all times on the water cart. A demonstration of the method employed for chlorination showed it to be satisfactory.

The Lyster bags, which were the only source of chlorinated water, were located at the geographical centre of the town and it was suspected that men billeted in the more remote sections used water from some of the more conveniently situated hydrants. This was confirmed by personal interviews with the men in the hospital. Although they appreciated that the raw water was unfit for consumption they nevertheless used it many times in preference to the chlorinated water. Two men admitted that they habitually drank water from street hydrants or pumps in their billets. Two others depended almost entirely upon beer which, they stated, was grossly diluted with water. Three men used water from a hydrant for cleansing their teeth.

Within fifty feet from the kitchen was a well, the water from which had been exclusively used for kitchen purposes from December 19, 1918, to January 1, 1919, at which time it became dry. A few days later water reappeared in this well and it was again used until the cooks noticed that it had a disagreeable odor. This was called to the attention of the battery commander about January 7th and from that date he prohibited its use. The proximity of this well to the latrine and the odor of the water furnish ample proof of fecal contamination.

It does not require any great imagination to recognize the possibility of a carrier, either soldier or civilian, having deposited the infecting bacilli in the latrine. This leads one strongly to the presumption that this was the source of the epidemic. Although examinations of the water from this well were negative for typhoid bacilli it was heavily contaminated with colon bacilli, which is again strong presumptive evidence of its guilt. Guards were stationed at all water points and strict orders were issued against the use of any but chlorinated water.

TYPHOID INOCULATION.

All members of the command had been inoculated against typhoid and paratyphoid A and B from six to sixteen months previously. Two men gave histories of illness in infancy during which they were confined to bed for several weeks but in all probability they had not had typhoid. Aside from these two men there were none who had had typhoid fever, therefore it was quite certain that we did not have a chronic carrier to deal with. The two men referred to were kept under observation for a month at Camp Hospital No. 10 but repeated examinations of gastric and duodenal contents and feces were negative.

CARRIER EXAMINATIONS.

On February 10, 1919, a systematic examination of the feces of every member of Battery E for organisms of the typhoid dysentery group was commenced. A single examination was made upon every man and, with the exception of twenty-six men, a second examination was made of the whole battery. This was deemed necessary as in the early examinations, made for the purpose of selecting a permanent kitchen force, two were negative on the first and positive on the second examination, the interval being one week. Three hundred and six feces examinations were made for the purpose of detecting carriers and, in addition to this, the actual typhoid cases as well as every member of Battery E, admitted to Camp Hospital No. 10 for any treatment, had from two to ten feces examinations. A total of 390 such examinations were made on members of this battery. As a result three men were found with typhoid bacilli in their feces and were sent to the hospital as carriers. In one of them the condition was later diagnosed as mild typhoid fever. The other two were kept under observation for over a month but subsequent feces examinations at intervals of from three to five days were negative. Before release from the hospital both of these men had seven consecutive negative laboratory reports.

INCIDENCE.

A study of the sick book, together with personal interviews with all of the men who had been sick during the month of January, revealed some interesting information. It became apparent immediately that we were dealing with three distinct groups of cases as indicated by the dates of onset. (Table 1.) The first case was hospitalized on January 16th, nine days after he had first reported as sick call (January 7th). This date, therefore, was taken to be the time of the onset of his first symp-

toms and consequently the beginning of the epidemic.

TABLE I.

Showing group incidence as determined by dates of onset.
GROUP I.

Identification Case Number.	Date of Onset.	Day of Admission.	Confirmatory Diagnosis.	Febriile Period.	
1 1918581	Jan. 7	9	15	26	Death 26
2 1356770	Jan. 12	4	24	29	Death 29
3 2228981	Jan. 14	3	16	38	Death 30
4 404010	Jan. 16	12	24	29	Death 29
5 1357379	Jan. 17	3	18	25	Death 25
6 2234957	Jan. 17	11	29	38	Recovery
7 2143735	Jan. 20	4	10	20	Recovery
GROUP II.					
8 1357517	Jan. 27	5	5	47	Recovery
9 1916614	Jan. 27	5	18	19	Recovery
10 1356718	Jan. 28	4	7	30	Recovery
11 2998785	Jan. 28	4	13	20	Recovery
12 1916505	Jan. 29	17	18	39	Death 30
13 2142582	Jan. 30	4	10	38	Recovery
14 1916605	Jan. 31	3	0	34	Recovery
GROUP III.					
15 1812542	Feb. 7	1	8	25	Recovery Cook
16 1918457	Feb. 8	2	2	24	Recovery
17 1639452	Feb. 8	2	11	24	Recovery
18 1916479	Feb. 9	5	2	11	Recovery
CARRIERS.					
19 1357136	Feb. 6	9	6	4	On K. P. until admission
20 1356893	Feb. 10	13	10	0	On K. P. until admission
SUSPECTED CLINICAL CASES					
21 2233966	Feb. 22	2	0	7	Recovery
22	Feb. 25	2	0	4	Recovery

The interval between the onset of the first and last case in Group I was thirteen days and the intervals between the onset and admission to the hospital varied from three to twelve days. The high mortality of this group suggests two things: a massive infection and a relation between mortality and delayed hospitalization. We believe that both factors were concerned in this instance. We feel quite certain that the well water was the source of the massive infection. It had been used, with the exception of a few days when the well went dry, from December 19th to January 7th, at which time the odor became so objectionable that it was reported to the battery commander and at this same time the first man, who was later diagnosed as having typhoid fever, reported at sick call. In view of the interval of thirteen days between the onset of symptoms in the first and last case in Group I, it is not improbable that the seven men were infected at different times. Statements from the men in the hospital substantiated this view. Some admitted that they had, at different times, washed their mess kits in this well water and that they had drunk it. On at least one occasion it was reported that the cooks had used water from this well to dilute the coffee. Two of the men in Group I, No. 2 and No. 5, were kitchen police.

The onset of the first case in Group II was twenty days after the first and seven days after the last in Group I. The interval between the first and last cases in Group II was only four days. It is our opinion that this group resulted from carrier or contact transmission. The two kitchen police in the first group could easily have been the source of infection for the second group. In addition to this nearly all of the kitchen force lived together in a room just in the rear of the kitchen. There was a member of the kitchen force in the

second group (No. 14). Two other men in Group II lived together and one man from Group II occupied a room with a man in Group III.

The four cases in Group III originated within a period of three days, February 7th, 8th, and 9th, and the intervals between the first case in Group III and the first and last cases in Group II were eleven and seven days respectively.

In the third wave the kitchen force was not spared, No. 15 being a cook. Directly upon the confirmation of the first typhoid fever case among the kitchen personnel (No. 2 positive feces February 5th) the entire kitchen force was reorganized, but on February 9th and 10th, two men from the new kitchen force (No. 19 and No. 20) were found to have typhoid bacilli in their feces and were sent to the hospital for observation. Neither of these men had positive fecal findings after the first examination and they were recorded as carriers. In the sense that they harbored typhoid bacilli in their intestinal tracts without being ill with the disease they were unquestionably carriers but they were not chronic carriers. On the other hand we consider these as examples of the failure to develop the disease because of the immunity established by inoculation, natural immunity, the ingestion of a limited amount of infectious material, or other similar factors. One of these so-called carriers, on at least four occasions had a slight fever without any other symptoms, and we are not convinced but that it would have been more accurate to classify him as a mild case of typhoid fever.

It was anticipated that a fourth group might present itself but such was not the case so far as could be determined. Two cases were regarded with suspicion and carefully observed (No. 21 and No. 22), but it was not possible to establish a diagnosis of typhoid fever in either instance. Although the agglutinin content of their sera was high and one (No. 22) had a positive complement fixation with typhoid antigen, these findings had a limited significance because both men were inoculated with French triple typhoid lipovaccine on January 31, 1919.

After the recognition of the first cases as typhoid fever a careful watch was kept of the temperature of each member of the battery and notes were made of the symptoms complained of by those reporting at sick call. The following were the complaints in the order of their frequency: Headache, eight; weakness or malaise, eight; anorexia, seven; fever, six; generalized pains, six; constipation, five; chills, one, and diarrhea, one.

Further study of the sick book revealed the fact that at the time that the typhoid cases were taken sick, there was a coincident increase in the total sick of this organization. Chart I illustrates this graphically. This suggests that some of these men may have had mild attacks of typhoid fever, perhaps modified by their previous inoculations, the symptoms not having been considered severe enough to cause them to be hospitalized.

Although there may be a reasonable doubt as to the source of this epidemic we believe that the evidence points strongly to the well as the primary

source of infection. The two most probable methods of transmission were: food contamination and contact. Members of the kitchen force might have been passing off typhoid bacilli for days without detection had it not been for the routine daily record of temperatures. By this means four men were discovered in the beginning of the disease that otherwise would have not been hospitalized until several days later. A circumstance that militated against the early discovery of any of the cases from subjective complaints was the fact that it was generally known that the division was scheduled for early return to the United States and for fear of being left behind in a hospital, the men would not report at sick call unless they were very ill.

CASES.

The following cases are briefly related in order to emphasize some features of clinical interest:

CASE I.—(11) Private Battery E, 321 F. A. Admitted February 1, 1919, complaining of headache, chilly sensations, pains in back and legs, vomiting

at sick call and said that he felt feverish and had experienced some abdominal discomfort. The examination by the battalion surgeon revealed no cause and he received symptomatic treatment. His name appeared on the sick book again on February 3rd and 5th but no record was made of his complaints. He did not report sick again but on February 8th he was discovered with a temperature of 99.2° F. On the following morning it was normal but in the afternoon was 100°. On February 10th and 11th there was no fever. On February 12th he was sent by his battalion surgeon to the regimental dental surgeon for an opinion regarding the presence of pyorrhea alveolaris sufficient to account for the intermittent fever. On February 14th, his temperature suddenly rose to 102° and on the following day he was sent to the hospital. On admission he complained only of slight malaise and poor appetite. The spleen was palpable. On the third, fourth and twelfth days there was abdominal pain, sharp and severe on the twelfth day. Four days after admission a crop of

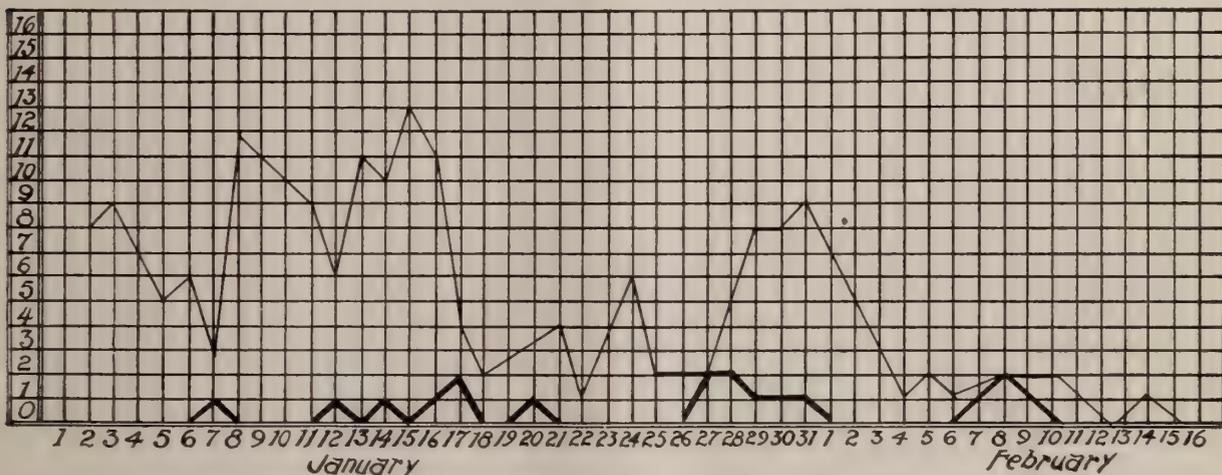


CHART I.—Showing the increase in the number of sick in Battery E, 321st Field Artillery, coincident with the onset of the group of typhoid fever cases. Light line represents total sick for the organization exclusive of typhoid fever cases; heavy line represents the typhoid fever cases.

and nose bleed. Onset January 28, 1919. The diagnosis of influenza was made. There were no objective symptoms of typhoid fever but on the thirteenth day the Bacillus typhosus was isolated from the feces. The temperature was between 102° and 103° F. for the first two days after admission, then 99° to 101° F. for fourteen days when it dropped by lysis to normal. The pulse averaged 80 and the respiration 20. There was no malaise. On the eighteenth day abdominal pain was complained of. No rose spots were noted at any time but on the eighteenth day the spleen was palpable. No blood culture was made. The diagnosis was based on a positive feces, a positive typhoid complement fixation, and a rise in the agglutination titre of the serum for typhoid bacilli. Inoculated with U. S. triple typhoid vaccine July 20, 1918. Febrile period twenty days.

CASE II.—(12) Corporal Battery E, 321 F. A. Admitted February 15, 1919, complaining of nothing but slight malaise and poor appetite. Onset January 29, 1919, at which time the patient reported

rose spots appeared. On the fifth day there was vomiting. The blood and feces were positive on the day after admission. The urine was culturally negative but gave a positive diazo reaction. The typhoid complement fixation was positive and the agglutination titre of the serum high. Both of these serological findings, however, would have been insufficient for a positive laboratory diagnosis in the absence of the positive bacteriological results as the patient had been inoculated with French triple typhoid lipovaccine on January 31, 1919. The temperature averaged 101° to 104°, the pulse 90 to 100 and the respiration 24. On the twelfth day there was sharp, severe abdominal pain with some abdominal rigidity and tenderness. The temperature dropped from 104° to normal, the pulse became rapid and thready, 134 a minute, and the respiration went up to 50. On the thirteenth day after admission the patient died as the result of perforation. The probable period of illness was thirty days, hospitalization being affected on the seventeenth day.

CASE III.—(14) Private Battery E 321 F. A. Admitted February 3, 1919, complaining of headache, constipation and poor appetite. Onset January 31, 1919, and attributed to exposure after a long railroad journey. The patient had been a permanent member of the kitchen police. Constipation was present for the first three days, on the fourth day some abdominal pain was complained of and on the fifth day there was diarrhea. A crop of rose spots appeared seven days after admission and the spleen was palpable on the twelfth day. On the eighteenth day signs of bronchopneumonia were noted. The temperature ranged from 99° to 101°, the pulse from 70 to 80, and the respiration from 18 to 20. Blood, feces and urine cultures were negative. There was a positive typhoid complement fixation and a moderate rise in the agglutination titre of the serum but the significance of these findings was relatively slight because of inoculation on January 31, 1919, with French triple typhoid lipovaccine. The febrile period was thirty-four days ending by lysis. The diagnosis was based on clinical observations but not confirmed by the laboratory.

(To be concluded.)

THE ADMINISTRATION OF DIGITALIS.*

By T. STUART HART, M. D.,
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Digitalis is a real drug. It is worth thinking about, worth talking about and worth using properly. Digitalis will relieve suffering. It will make efficient and prolong the activity of many a damaged heart; often it actually saves life. Also, because it is a real drug it has its dangers. Many a man with a diseased heart does not need it. In a considerable number its administration is distinctly detrimental. I have seen more than one case in which I am quite sure it actually shortened life.

I shall not spend time in discussing at length the indications and contraindications for the administration of digitalis. There are certain groups of cardiac cases in which its use is positively indicated; there are others in which it is just as certainly contraindicated, and there is a very large group in which, in the present stage of our knowledge, it is impossible to make a dogmatic statement, and our only recourse is to try digitalis in effective doses under close observation and watch for its effects. It seems to me that one of the promising fields for study for the individual members and for groups in this Association of Cardiac Clinics, composed of men who are every day seeing so many patients suffering from disordered circulation of all types, would be to study the effect of digitalis on these large groups in which our knowledge is so inadequate, to tabulate the results obtained with all the evidence, and attempt to formulate further rules for the use of this drug. We might thus make some advance and a real contribution to our knowledge of this important subject.

It seems to me that there are just two satisfactory methods of administering digitalis, by mouth and intravenously. Personally I never use digitalis subcutaneously. The active glucosides have a very irritating effect on the soft tissues and invariably when given subcutaneously, produce an area of tenderness and redness which may be very sore and cause the patient a great deal of unnecessary discomfort. When I meet one of my physician friends who is using digitalis subcutaneously, I always ask him whether it does not produce this reaction; frequently he will reply that he has found a new preparation which he is now using subcutaneously and which causes no subsequent discomfort. In my experience this means just one thing, he is using an inactive preparation. When a subcutaneous injection of digitalis gives satisfactory results it also produces local irritation, when there is no local irritation I have failed to obtain a physiological effect. The local effect of the subcutaneous administration is in a way the measure of the potency of the particular preparation. We have a number of preparations which are suitable and convenient for intravenous use, the method is simple, it is the quickest and surest way to obtain physiological results and it causes no local irritation. It is obvious that comparatively few patients are in such an urgent condition that the intravenous route is necessary or advisable; most of our digitalis will be given by mouth.

At the risk of stating what today should be obvious to every physician I want to speak a word in regard to the dose of digitalis. It must be given in quantities sufficient to produce physiological effects. It is distressing to me to see how frequently today one meets physicians of large experience and who are in most respects skillful practitioners, who seem to have no conception of the amount of digitalis which should be administered. They tell you that they have tried digitalis and can get no satisfactory results. On inquiry one often finds that they are administering an inadequate quantity of a good preparation or that they are giving considerable quantities of a preparation which has little real activity. It is often extremely difficult to get physicians to give digitalis in effective quantities and to persuade patients who need it to take it continuously. There are all sorts of traditions in regard to digitalis which seem to die hard. For example, I am frequently told by patients and physicians too that digitalis may be all right while the patient is in bed or sitting in a chair, but they fear disaster if he takes it when walking about. I need not comment on this point of view. Another much dreaded attribute of digitalis is that it unduly raises blood pressure. In some cases with broken compensation the effect of the administration of digitalis is certainly to raise blood pressure. One sees this frequently in cases of auricular fibrillation with low pressure, and in certain cases of hypertension with hearts unable to maintain the pressure which is adequate for the individual needs of the patient, in both of these groups the blood pressure rises as the patient improves. I believe that the favorable results are obtained in these patients by a direct

*Read before the Association of Cardiac Clinics May 11, 1920.

action of the digitalis on the heart muscle and not by a contraction of the peripheral blood vessels. In hypertension without decompensation I have repeatedly administered full doses of digitalis without perceptibly affecting the blood pressure.

One of the most difficult notions to combat is the idea that even the smallest doses of digitalis produce nausea. I believe there is an occasional patient who has an idiosyncrasy to digitalis in whom the vomiting centre is exceedingly sensitive to the drug. These are so rarely seen and so inconsiderable in number that they need scarcely be considered, and yet it sometimes seems to me that nurses and physicians vie with one another in their efforts to impress upon the patient that nausea is one of the early toxic symptoms of digitalis, then when a patient has nausea from the force of suggestion or from some other cause bearing no relation to the administration of the drug, the physician at once orders it discontinued or more often the patient refuses to take it. A patient in whose mind this idea has been thoroughly implanted is sometimes extremely difficult to convince that the digitalis which he regards as his enemy is really his best friend. I very rarely see nausea which is caused by too much digitalis. Far more frequent is it to meet with nausea due to chronic passive congestion of the digestive viscera which the proper administration of digitalis will entirely abolish.

Through the careful studies of Eggleston and others we are now able to calculate approximately the total amount of a digitalis preparation of known strength which it will be necessary to administer to obtain complete cardiac digitalization. Such a calculation permits us to produce complete digitalization much more rapidly than before these formulæ had been worked out. The method advocated by Eggleston is to give at once half of the amount calculated as necessary to produce complete digitalization, six hours later there is given an amount equal to half of the initial dose and at two subsequent six hour intervals a dose half of the second dose. By this plan of administration full effects can be obtained in a majority of instances in from twelve to thirty-six hours.

I have found that when digitalis is administered in these amounts one may not infrequently exceed the dose desired and to say the least may make a considerable number of his patients quite uncomfortable. There is rarely the necessity of thus hastening the production of full effects, and except in the exceptional case I feel that the slower method of administration is much to be preferred. If the Eggleston method is to be used certain precautions must be borne in mind. In calculating the dose due allowance must be made for fluid in the subcutaneous tissues. One must be sure that the patient has not been recently taking digitalis, and to quote Eggleston's own words, "the use of such large doses . . . is not a safe procedure unless the patient can be under nearly constant observation and unless the effects of the treatment can be graphically recorded at frequent intervals."

After a heart is thoroughly digitalized and one has found out just the amount of a given prepara-

tion which is necessary to keep it under proper control, intervals of administration are of very slight importance, if a man needs twenty minims of a certain tincture of digitalis each twenty-four hours it makes no difference, except as a matter of convenience, whether he gets a single dose of twenty minims a day or ten doses of two minims each. There is one factor in the administration of fluid preparations which, while seemingly trivial, is of considerable practical importance, and that is the exact measurement of the dose. On account of the inaccuracy of the medicine dropper patients should invariably be instructed to use a minim glass, even thus administered a considerable variation may occur, and for this reason I feel that the solid standardized preparations put up in tablets or in capsules permit of a more precise dose. The uneven or jerky administration is to be avoided as far as possible; one can most plainly see the undesirable effects of such a procedure in cases of auricular fibrillation where the heart rate is a fair indicator of the degree of digitalization. The drug is commenced with doses of considerable size, the heart rate begins to fall, and after a few days perhaps reaches a rate of sixty, then digitalis is stopped; none is given for a few days and the rate rises to one hundred; then considerable doses are again given and the rate again drops to sixty and the drug is again discontinued. A better way is to allow the rate to reach sixty, then discontinue the drug for twenty-four hours, and begin again with a small daily dose. If it appears that this dose is insufficient to hold the heart at the desired rate the daily dose is slightly increased until we find the exact dose which keeps the heart at its most efficient level; by this method the heart is much better controlled and a great deal of time is saved.

It is well known that in a large number of cardiac conditions we have no such simple guide to the degree of digitalization as is furnished by the heart rate in auricular fibrillation. It is true that such evidence is furnished by the electrocardiograph, but few of us have the opportunity to follow the routine of our cases by this method. It would, therefore, be greatly to our advantage if we were able to use preparations which were carefully standardized so that when we had given a definite amount of one of these preparations we would be morally sure that we had secured effective digitalization.

It appears to me that it would be a very valuable function for the Association of Cardiac Clinics to assume the oversight of the standardization of preparations of digitalis, and I would like to present this thought for your consideration. This could be accomplished by appointing a committee from among the many distinguished members of the association who could, in the first place, formulate standards and later could supervise the examination of preparations on the market much in the same manner that the Milk Commission of the County Medical Society supervises the milk supply. I should like to see marked authoritatively on every bottle containing digitalis the amount in cubic centimetres or grams to the kilo of body weight which should effect complete digitalization.

The aggregate amount of digitalis used by the members of the association must be very great. I think we should soon find that a number of manufacturers would be willing to submit their digitalis preparations to a committee of this association for standardization and would gladly defray the expense of the necessary biological tests for the sake of a suitable endorsement of their products by this association.

160 WEST FIFTY-NINTH STREET.

HYPERTENSION AND ARTERIAL FIBROSIS.

A Preliminary Report.

By C. T. HOOD, M. D.,

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There are several reasons for this preliminary report. First, there still remain some unsolved problems, if the hypothesis is to be proved beyond dispute, and it is with the hope that others who are interested in research work will take up this problem, and under better conditions and surroundings complete the findings. Second, clinical evidence, to be of value, in hypertension and arterial fibrosis, must extend over years of time, and the writer trusts that many of his colleagues will thoroughly test the clinical facts related in this paper, and report their results. Third, at the present time, the profession has practically nothing to offer to individuals suffering from hypertension and arterial fibrosis. Fourth, and most important, the clinical results warrant this preliminary report. The details of the experimental work covering now more than five years will be reported at another time.

Perhaps it may seem to the reader that the subject is too broad and covers too much ground, to be considered at one time, but I believe that the stereotyped methods of considering hypertension and arterial fibrosis, each as an entity, is responsible for much of the present poor conception of these conditions, and the present uncertainty of their treatment.

Hypertension and arterial fibrosis are no respecter of persons. They are found in the rich, the poor, the middle class and in the alcoholic; and yet, many old bums whose bodies have been pickled in alcohol almost from boyhood, have neither of them. One man, whose business requires intense mental attention, has both. In another person, under the same conditions, they never develop. Many of the women of the street go free, while in the woman of the home, under the most favorable conditions possible, they develop. One man is habitually constipated and has been all his life, and never presents one positive finding. Another succumbs to them. In other words, so far as we know, we have no definite data as to the etiology of hypertension and arterial fibrosis. Therefore, if he who causes two blades of grass to grow where only one grew can be called a philanthropist, then if we can throw but a passing shadow across the path of this condition, which is taking a greater death toll than

any other disease, not excluding tuberculosis and pneumonia, if we can but hold the light, while some ray penetrates these obscure conditions, we will have done all we hope to do.

In presenting this paper to the profession, we are well aware that we are laying ourselves open to severe criticism, but thirty-five years of active, intensive study and practice have made us immune to criticism, and knowing that we have obtained results, and that others are obtaining results, working along the same lines, prompts us to present the results of these years of intensive study to the profession. In a way the hypothesis to be presented is not new to the profession, yet, the working out of the pathology is. With the exception of the cancer problem, hypertension and arterial fibrosis are two of the greatest unsolved medical problems of the day.

We must ask the reader's indulgence, while we recapitulate some well known facts which are necessary, in order that we may understand the subject under consideration. I believe that there are five types of hypertension:

PHYSIOLOGICAL HYPERTENSION.

In this type, the individual in whom it is found is from sixty to seventy-five years of age. The systolic pressure is 170 to 190, or even 200, with some increase in the diastolic pressure above the normal. The left ventricle is enlarged to some extent, and the aortic second sound somewhat snappy, the urine, while of comparatively low gravity and may at times contain a trace or a considerable quantity of albumin and a few casts, yet, the specific gravity is not fixed, and the night urine is of small volume. In this type of hypertension, the increase in the systolic pressure is due to the wrinkling of the skin, the contraction of the liver, kidneys and spleen, the result of age. This contraction necessarily obliterates an extensive amount of the capillaries. Therefore, if the circulatory balance is to be maintained, and the increased capillary resistance overcome, hypertension must result. This increased capillary resistance is of gradual onset. For some time, years perhaps, the left ventricle is able to maintain the increased pressure necessary to keep up a normal circulation, but by degrees, the back-pressure from the capillaries causes some thickening of the arterial walls, not a true arterial fibrosis, but sufficient thickening to enable the left ventricle to maintain the required hypertension. In this type of cases, the individual presents none or but few of the clinical symptoms of arterial fibrosis. They are able to go about their life, and while not performing a full day's work, are capable of doing from a half to two thirds of a day's work, and as a rule, are rested in the morning. They rarely die of heart failure, but as a rule, from some acute infection, to which they are more susceptible, owing to their lowered resistance.

We wish it to be understood that we are not considering true atheroma, for true atheroma is a much more rare condition than was formerly supposed, and than the laity understand when they speak of hardening of the arteries, but in true atheroma, the hypertension which is present is a necessary physiological process to maintain a normal circulation.

HYPERTENSION IN THE YOUNG.

The second type of hypertension is that type found in comparatively young people, from thirty-five to forty-five years of age. The systolic pressure is from 160 to 190, with some increase in the diastolic pressure, the left ventricular impulse, while somewhat increased in its muscular action, has not, as yet, hypertrophied, the urine is increased in amount. It may contain casts or even a plain trace of albumin, but the specific gravity is good, and the night urine, if there is any at all, is small in amount. The secretion of urea may be somewhat below the normal, but the secretion of chlorides is low.

ARTERIAL FIBROSIS.

The third type of hypertension is due to true arterial fibrosis, and is not due to a physiological process, not due to atheroma, and not the result of chronic nephritis or hyperthyroidism, but the condition begins by an increased resistance in the capillaries, that ultimately results in left ventricular hypertrophy and arterial fibrosis. The pathological condition found in this type we shall consider later. These individuals are from thirty-five to fifty-five, or may even be sixty years of age. The systolic pressure is from 175 upward, with a marked increase in the diastolic pressure.

CHRONIC NEPHRITIS.

The fourth type of hypertension is the result of chronic nephritis. Here, the hypertension is due to the increased resistance in the kidney. The left ventricle hypertrophies to meet this increased resistance, and the back pressure from the kidney results in actual arterial fibrosis, with more hypertrophy of the left ventricle, dilatation and roughening of the aortic arch, and a systolic murmur at the base, a snappy aortic second sound. If the left ventricular hypertrophy becomes extensive, or if from nutritional changes, the left ventricular walls stretch the mitral opening, a mitral systolic murmur will be found. The urinary findings are those of a chronic nephritis, or, more properly, a chronic interstitial nephritis. They are a low fixed specific gravity, a trace of albumin up to one per cent., casts, both hyaline granular and sometimes epithelial. If the chronic nephritis is the result of an acute and subacute glomerular nephritis, fatty casts or fatty globules will be found. The volume of the night urine is equal to or greater than the day urine. The urea is low, as well as the chlorides.

HYPERTHYROIDISM.

The fifth type of hypertension is due to hyperthyroidism, which is never extensive, and never causes death, and is due to the thyrotoxicosis, which produces a spasm of the arterial walls, but never true arterial fibrosis.

In order that we may have an intelligent conception of the subject, we must understand the factors concerned in the production of normal blood pressure, and how these factors may be influenced. We believe that we are absolutely correct, when we say that it is the heart muscle which maintains the normal systolic blood pressure, and that it is the resistance of the coats of the ar-

teries, supplemented by the capillary resistance, that produces the diastolic blood pressure. The factors then concerned in the production of normal blood pressure are, first, the contraction of the heart; second, the volume of blood in the body; third, the resistance offered by the coats of the arteries; fourth, the capillary resistance.

That the contraction of the heart muscle is the first and most important factor in the production of the systolic blood pressure is selfevident. That the volume of blood plays an important part in the ability of the heart muscle to maintain the systolic blood pressure is easily understood. Much has been written, regarding the velocity of the blood stream, in maintaining the systolic blood pressure. The velocity of the blood stream depends upon three factors; first, the size of the stream of blood, which is governed by the size of the arteries; second, the contraction of the muscular coats of the arteries, and, third, the force of the contraction of the heart muscle. With these facts in mind, I am unable to see how the velocity of the blood stream can present any factors in the production of blood pressure not already considered.

The resistance offered by the muscular coats of the arteries must influence the contraction of the left ventricle, for if the contraction of the left ventricle is to empty its contents into the aorta, it must first overcome the weight of the volume of blood in the aorta, and the resistance offered by the muscular coats of the aorta, and the resistance of the blood stream ahead of the aorta. But why is it necessary that in the normal person, the heart muscle must overcome a resistance equal to from 120 to 140 mm. of mercury? Surely it is not to overcome the weight of blood in the aorta and the resistance in the muscular coats of the aorta. No, the resistance offered by the blood in the aorta and the coats of the aorta is due to the back pressure of the blood stream ahead of the aorta. To what is this back pressure due? First, to capillary resistance; second, to the coats of the arteries. As is well known, the function of the muscular coats of the arteries is to change the interrupted flow of blood in the arteries into a continuous flow in the capillaries. In other words, that the flow of blood may be maintained in the capillaries in a normal manner, namely, a continuous stream, constant pressure must be maintained upon the blood stream. Capillary resistance, then, is the real reason for the normal diastolic blood pressure, and the diastolic pressure is the reason for the systolic pressure.

What practical deductions can we derive from these facts? First, any condition that increases or decreases the force of the contraction of the heart muscle will raise or lower the systolic blood pressure. Second, any increase or decrease in the volume of blood will raise or decrease the blood pressure, both systolic and diastolic. Third, any condition which will increase or decrease the size of the arteries will raise or lower the systolic blood pressure. Fourth, any condition which will increase or decrease the velocity of the flow of blood through the capillaries, or, in other words, raise or decrease the capillary resistance, will increase or decrease the

diastolic blood pressure, and thus increase or lower the systolic blood pressure. Many experiments have been carried on to prove these statements, but I believe them to be correct. Clinical examples illustrating these facts are common.

When, from any cause, the heart muscle degenerates or dilates, the systolic blood pressure falls, as does also the diastolic pressure, but the diastolic pressure, does not fall to the same degree that the systolic does. When hypertrophy of the left ventricle occurs, independently of aortic valve disease, the systolic blood pressure is decreased, as in hemorrhage the systolic blood pressure falls, and it may be raised by transfusion, especially the intravenous saline transfusion. If the capillary walls suddenly relax, the systolic blood pressure falls. Such a condition we have when a patient faints, and such a condition exists to a large extent in what is called shock, following the long continued administration of an anesthetic, while the contraction of the capillaries, as in a chill of the surface of the body, the systolic blood pressure will be raised. If a chronic nephritis exists, and the capillary resistance in the kidney is raised, the systolic blood pressure must be raised, in order that kidney function may be carried on. If the heart muscle fails, the kidney function fails or ceases in proportion as the systolic pressure falls.

From these facts, we conclude, first, that capillary resistance is responsible for the diastolic blood pressure; second, that the diastolic blood pressure, or the capillary resistance is the reason for the systolic blood pressure; third, that the heart muscle is responsible for the systolic pressure.

With these facts in mind, let us see if we can deduce a probable hypothesis for hypertension and arterial fibrosis. Considerable time has been given to the part the vasomotor nerves play in the production of hypertension and arterial fibrosis. I do not believe that the vasomotor nerves play any part whatever in the production of permanent hypertension or arterial fibrosis. If this fact is kept distinctly in mind, namely, that the reserve power of the heart or that heart power which is employed when effort is made, this reserve power of the heart is capable of wonderful variations, and as we know, it is the contraction of the heart muscle which produces the systolic blood pressure. Then, when we recall how varied the force of the heart muscle is, under exertion, we must know that the systolic pressure would vary to a great extent, if the calibre of the arteries remained the same, but the vasomotor nerves regulate the size of the arteries to meet the force of the heart muscle. This we believe to be the function of the vasoconstrictor and vasodilator nerves. In other words, the vasomotor nerves are the governors upon circulation, and by their action upon the coats of the arteries maintain the circulatory equilibrium. But physiology teaches us that nerve force cannot be continually applied; therefore, the vasomotor nerves cannot be a factor in the production of permanent hypertension or arterial fibrosis.

What, then, will produce permanent hypertension and arterial fibrosis?

We have already spoken of physiological hypertension, due to contraction of the capillaries, the result of old age. We know that it is on account of the capillary resistance that a systolic pressure is necessary, but what causes the capillary resistance? First, the resistance offered by the splitting up of the arterioles into extensive and exceedingly small vessels; second, the pressure of the body fluids upon the capillaries.

The first proposition is self-evident; the second requires some explanation. We know that the human body contains eighty per cent. fluid, and that this fluid state is absolutely necessary for life. We also know that hydraulic pressure is equal in all directions; therefore, the pressure of the body fluids is exerted as much upon the walls of the capillaries as it is upon the body tissue. If this is true, and we believe that it is, then, the fluid pressure of the body is responsible, entirely or in most part, for the capillary resistance, and any variation in the fluid pressure of the body will influence the capillary resistance. If the capillary resistance is raised, by reason of an increase in the body fluids, the blood stream is held back in the arterioles, backed up from the arterioles into the large arteries. Finally, the pressure is exerted upon the aorta, and by increasing the resistance in the aorta, the left ventricle must increase its force to overcome this aortic resistance. In other words, while the vasomotor nerves may be able to accommodate the size of the arteries to meet the increased resistance in the capillaries, if this increased capillary resistance be continued beyond the physiological time for vasomotor activity, the back pressure is referred to the heart muscle, and hypertrophy of the left ventricle results. If the capillary resistance is continued over years, the left ventricle hypertrophies, and so long as it can maintain the circulatory equilibrium with the arteries at a normal size, this is all the changes required. But if the capillary resistance continues, and the left ventricle finds itself unable to maintain the circulatory equilibrium, then, the coats of the arteries, which have already felt the strain of the increased systolic blood pressure, become fibrosed from necessity, in order to decrease the size of the arteries, and thus assist the heart muscle in maintaining the systolic pressure. And it is such pathological changes that we find at the postmortem table. We find hypertrophy and dilatation of the heart, with fibrosis and dilatation of the aortic arch.

Remember, we are not considering true atheroma with infiltration of the arterial walls, but the much more common condition of arterial fibrosis. Again, we may find arterial fibrosis extending along the large arteries, and sometimes, but rarely, in the smaller arteries. But you ask if the small arterioles are the first to feel the back pressure from the increased capillary resistance, why do we not have arterial fibrosis present more frequently in the smaller arteries? For a purely physiological reason. It is the law of nature that when increased work is required of any part of the body, so long as that part can obtain sufficient blood supply it will increase its working power sufficient to meet the requirement.

The back pressure in the individual arteriole is small, but the aggregate back pressure in many arterioles and small arteries is great, and the full force of the back pressure is exerted upon the aorta and the left ventricle. Thus, we have hypertrophy of the heart, first of the left ventricle, and so long as the left ventricle can hypertrophy to meet the increased resistance, the rest of the heart enlarges but little, but when the left ventricle begins to dilate and the mitral ring is stretched, and the blood begins to be pumped back into the lungs, then, the right ventricle hypertrophies to lend its assistance to the left ventricle, in maintaining the circulatory equilibrium. Ultimately, if the capillary resistance continues, the coronary arteries will fail to supply the heart muscle with sufficient nutrition, or the coronaries may be fibrosed, and the heart muscle will dilate with resulting passive congestion.

SUMMARY.

Increased tissue fluid pressure causes, first, increased capillary resistance; second, hypertrophy of the heart; third, fibrosis of the arteries.

Therefore, the practical application of these facts is, what can and does increase the body fluid pressure in the capillaries? Without, at this time, detailing the experiments which have convinced us of this hypothesis, we believe that it is the presence of sodium chloride in the tissue that brings about this condition. That salt will hold back the body fluids has been abundantly proved, and the clinical results obtained from this fact can be proved by anyone.

Sodium chloride is used in the human body for two and possibly three purposes. First, it is from the sodium chloride that the hydrochloric acid of the gastric juice is made. Of this we have abundant proof. Second, sodium chloride probably plays some part, although this is questionable, in the alkalinity of the blood stream. Third, sodium chloride holds back or retains the fluids in the tissues of the body. It is plain that if the body fluids contain an abnormal amount of sodium chloride for the individual, the intratissue fluid pressure is increased, capillary resistance is raised, and ultimately we have hypertrophy of the heart, with arterial fibrosis.

I am convinced of the truth of these statements. When we remember that the human body requires from thirty to sixty grains of sodium chloride in twenty-four hours for perfect health, and then recall how much sodium chloride is as a rule consumed by the ordinary individual in twenty-four hours, it is not hard to see how capillary resistance is increased. But it is not necessary that the individual be an excessive salt eater. The question is, To what extent is the sodium chloride eliminated from the body? Sodium chloride is eliminated from the body, aside from that used in the manufacture of hydrochloric acid for the gastric juice, first, by the skin and tears; second, by the lungs, to a very small extent; and third and principally, by the kidneys.

Now for the clinical application of these facts. In the first type of hypertension, the physiological type, it must be kept distinctly in mind that these individuals who have a physiological hypertension re-

quire an increased systolic pressure, in order to maintain a circulatory equilibrium. Many of these persons die of some acute infection, owing to their lowered resistance, but if they do not die from the acute infection, they die from heart failure, and they all have a secondary anemia to a greater or less degree. By putting these people upon a salt poor diet, and keeping them on this diet for a time, their excess sodium chloride becomes filtered out. This relieves the kidney of the work of eliminating the chlorides, and permits the elimination of more nitrogen and urea, thus making it possible to allow these people a more liberal protein diet, but keeping them upon a salt poor diet also lowers the systolic pressure, and to some extent the diastolic pressure, to the normal for the individual.

In the second type of hypertension, the pseudo fibrosis, if the individual is comparatively young, from thirty-five to forty-five years of age, the most of them are overweight. They have been good feeders, and have drunk a large amount of liquid, and strange as it may seem, by far the greater number of them have eaten an excess of salt. The urine may show a normal amount of chlorides, for it must be remembered that the blood stream can hold only so much sodium chloride; therefore, the kidney rarely eliminates an excessive amount of chlorides, although this may occur for a short time, but in these cases, even with their excessive liquid drinking, the volume of urine is but little above the normal. Placing these persons upon a salt free diet for a few weeks or two or three months, with a restricted diet in amount, will work wonders. They will do better to dispense with tea, coffee, and tobacco, but they may use these in moderate amounts. By the withdrawal of the salt from their diet, they will at once cut practically all the meats out of their diet, as they will have no taste for unsalted meats for some time, and no salt meats are permitted. The amount of liquids they require is reduced to the minimum, but the volume of the urine will be increased, in some instances enormously increased for a time. They will lose weight for a few weeks, at a rapid rate, then more slowly. By degrees, the volume of urine becomes normal, the gravity is usually above the normal, the systolic pressure will drop rapidly, and if the diastolic pressure has been increased, it will also come down. The dyspnea upon exertion will disappear, the sleep will become better, and they will get up in the morning refreshed.

In the third type, the true arterial fibrosis, the results are not so marked, but the kidney efficiency will be increased, the systolic pressure will be reduced as well as the diastolic pressure. The elimination of the amount of nitrogen and urea will be increased. The aortic second sound will lose some of its snap, and the general condition of the patient will be much improved.

In the fourth type of hypertension, that due to chronic nephritis, not so much can be accomplished, although it is perfectly wonderful what the salt free diet will do for these patients, if it is persevered in for months, and they are permitted to take a well balanced diet. For it must be distinctly borne in mind that besides the uremic symptoms, the most

important symptoms are those due to heart failure and the coexisting secondary anemia. The heart must be closely watched, and given what assistance it requires.

In the fifth type of hypertension, that accompanying exophthalmic goitre, we have had some excellent results by putting these people upon a salt poor diet, the use of the ice bag over the thyroid, the hydrobromate of quinine, and some heart assistants, as sparteine or strophanthus. The sweating quickly subsides and the kidney function is increased, although the diarrhea ceases.

As has been said, the hypothesis we present is in many ways not new to the profession, and we make no assertion that a salt poor or a salt free diet will cure true arterial fibrosis or chronic nephritis, for we know full well that when fibrous changes have once taken place in the arterial walls, these changes will continue for the life of the individual, but we are assured, after more than five years of observation in a goodly number of cases, that such a diet, so far as we can find out, apparently stops the further extension of the fibrous changes, and the individual, if he continues to take only the necessary amount of sodium chloride, may live out his days. We know that in chronic nephritis, where actual pathological changes have occurred, nothing can replace the kidney structure, but by withdrawing the salt from the diet of these individuals for months, and then permitting them only ten to fifteen grains a day, relieves the kidney of much work, permits a much richer protein diet, and thus prolongs the patient's life.

REMEDIES TO ASSIST IN THE ELIMINATION OF THE CHLORIDES.

This is one of the unsolved problems. So far, we have found but one drug, potassium nitrate, which in any way increases the elimination of the chlorides, and this drug is effective in not more than seventy-five per cent. of the cases. Large doses of potassium nitrate increases the volume of the urine, but not the twenty-four hour output of the chlorides, while smaller doses of the drug, as five grains to the ounce, and fifteen drops in a half glass of water, three times a day, will not increase the volume of urine, but will increase the amount of chlorides up to the normal, and maintain this until the individual is filtered of his excess chlorides. In chronic nephritis, potassium nitrate is of little avail, except in the true arteriosclerotic nephritis. In chronic nephritis, other than the arteriosclerotic type, when the urine is of a low fixed specific gravity, with the kidney function from five to fifteen per cent., the administration of eserine, one fortieth of a grain three times a day will increase the chloride elimination for several weeks, then the chlorides will fall to almost nothing, and the nitrogen and urea elimination will increase, often to a marked extent. The question of nephritis of the acute type and what part sodium chloride plays in making it possible for secondary changes to occur is an exceedingly interesting subject, and one fraught with great possibilities.

I believe that it is now considered by the profession that the iodides or iodine has no place in

the treatment of hypertension or arterial fibrosis, that they have no influence whatever upon the course of the disease, that the nitrates, while of service in temporarily reducing the hypertension, to relieve the anginal attacks, are of service, but so far as influencing the course of the disease or producing any permanent results, they are not productive of good.

The salt poor and salt free diet have been used for some years by many clinicians, in the treatment of chronic nephritis, but salt free diet has never, so far as we know, been pushed to the point of the removal of the surplus sodium chloride from the body, and keeping the tissue sodium chloride content at the physiological amount. Herein lie the possibilities.

ENDOCRINOLOGY.

There has been considerable discussion recently regarding the part that the internal secretions play in the production of hypertension and arterial fibrosis. We know some facts regarding the functions of the internal secretions.

The thyroid may cause some increase in the systolic blood pressure, as we find in many cases of exophthalmic goitre, but in other cases of exophthalmic goitre there is a low systolic blood pressure. Simple goitres which become toxic are more likely to increase the systolic pressure. So far as I have observed, and the observation has been fairly extensive, overacting thyroids may increase the systolic pressure, but do not increase the diastolic pressure.

The administration of adrenalin will raise the systolic pressure for a short time, and the lack of suprarenal secretion in the circulation will result in a low systolic pressure. We know, from the ability of adrenalin to control capillary hemorrhage, that it causes contraction of the capillary walls; hence, when there is a lack of adrenalin in the circulation, the capillary walls are relaxed beyond normal. That the secretion of the adrenalins have something to do with maintaining a normal capillary calibre is selfevident, but so far as our knowledge goes, it has nothing to do with the production of hypertension or arterial fibrosis.

In the few cases of Addison's disease that I have had the privilege of studying and observing some facts were common to all. First, the chlorides were below normal in the urine. Second, without exception, individuals suffering from Addison's disease were light salt eaters. We, therefore, are led to conclude that internal secretions do not in any way alter our hypothesis; namely, that sodium chloride holds back the tissue fluids; that an increase in the sodium chloride content of the tissue fluids increases capillary resistance; that increased capillary resistance requires an increased systolic pressure; that an increased systolic pressure demands extra effort on the part of the left ventricle, which may result in hypertrophy of the left ventricle or even hypertrophy of the entire heart, and that arterial fibrosis is an effort on the part of Nature to assist the heart muscle in maintaining the required systolic pressure.

2959 WASHINGTON BOULEVARD.

A CASE OF UNILATERAL CHOKED DISC.

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CASE.—N. A., aged ten, came to the outpatient department of the Episcopal Hospital on April 28, 1919, with the history of increasing blindness in the right eye, following an attack of intense pain over the right forehead accompanied by a scaly rash over both sides of the face. He had had no ocular treatment except glasses at the Wills Eye Hospital two years before.

Upon examination, the right eye was absolutely blind to strong light stimulus. The pupil was inactive to light, but reacted consensually with the fellow eye. The right eye was slightly divergent and perhaps a shade more prominent, but the muscle movements of both eyes were normal. The tension was normal. Ophthalmoscopically the right eye showed a choked disc with apex best seen with plus 6 D the periphery of retina with no lens. The disc was intensely swollen, the vessels were completely hidden appearing again on the retina, with many hemorrhages along the course of the vessels. The left eye had normal vision and practically normal eyeground, the nerve being too grey for his age. The Wassermann, Von Pirquet test and urine were found negative. The x ray examination showed a normal pituitary and normal nasal sinuses. The nasal examination was negative. The general medical examination by Dr. Hooker was negative.

He was then placed on increasing doses of iodide of potassium. There was a gradual decrease of the edema beginning in the periphery of the retina, until the nerve alone appeared swollen, with evidences of chorioidal changes appearing on the temporal and lower sides of the disc.

The vessels were first visible in the periphery with outlines of the disc appearing about two months after the beginning of the treatment. For the vision there was light perception about two weeks after treatment was inaugurated, gradually increasing to fingers counted in five weeks and 20/100 in two months. At the present time his vision is 15/70 plus. His fields of vision are contracted, uniformly

is a semitransparent membrane, which may be a remnant of the hyaloid or more likely exudate resulting from the intense inflammation. The vessels are of good size. The chorioid is disturbed with partial absorption of pigment for a distance of nearly a disc diameter to the temporal and lower sides of the disc. There are no indications of previous hem-

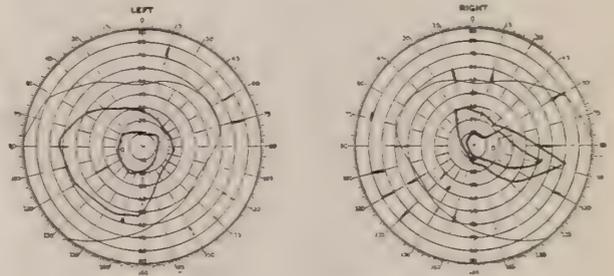


FIG. 2.—Perimeter charts of N. A., January 14, 1920; O. D., LXX—

orrhages. The disc of the left eye, seems too grey— but no gross changes are marked.

The patient has always held his head at an angle. Upon close fixation the right eye tends to turn out. When the fixing hand is carried to the left, the right eye turns inward and upward. (Inferior oblique). When fixing above the horizontal meridian the right eye turns upward and outward. (Superior oblique.) The excessive action of the oblique muscles is probably due to a central cause, following the convulsive seizures.

In the further study of this case we have the following history: His father and mother are well. He has an older sister and a younger brother. Previous to patient's birth, the mother had had two miscarriages.

The patient had convulsions up to his sixth year and especially with the oncoming of the following infectious diseases, measles, chicken pox and pneumonia. The patient has been apparently healthy until three weeks before his appearance in our clinic when he had intense headaches, not relieved by aspirin tablets given him by his mother.

The eyesight was bad immediately with the headaches, but gradually became worse, until he had no vision. In establishing the etiological factor in this case, the miscarriages of the mother above noted are suggestive. The patient showed much improvement under potassium iodide taking forty-five grains three times daily without general symptoms, thus demonstrating the so-called therapeutic test for syphilis. The Wassermann test was negative. This in itself does not prove the absence of syphilis, though I am constrained to believe that a positive Wassermann is proof of its presence. Though marked neuroretinitis was present only in the right eye, an involvement of the left eye is seen in the accompanying fields, which show the left field considerably affected, indicating an optic atrophy. The specific character of the inflammation is also suggested by the improvement possible after severe involvement of the optic nerve (shown in the choked disc).

The retinal vessels instead of being contracted as one ought to expect, were nearly normal in size in the cases examined.

1701 CHESTNUT STREET.

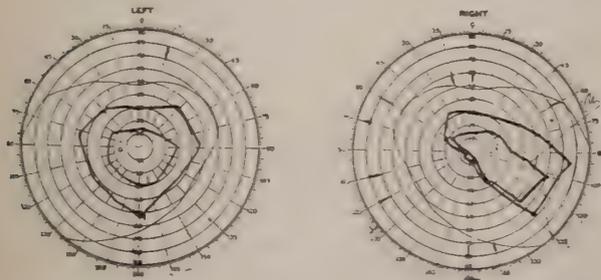


FIG. 1.—Perimeter charts of N. A., October 13, 1919. Light lines, red; heavy lines, white.

in the left eye and greatly narrowed in the right eye, except to the temporal side.

The ophthalmic appearance of the right eye is as follows: Media clear, disc is oval—90°, quite pale in tint. Running directly across the nerve at axis 105°

SHIFTING AS AN AID TO VISION.

BY W. H. BATES, M. D.,
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When the eye regards a letter with normal vision either at a near point or at a distance, the letters appear to pulsate, or move in various directions, from side to side, up and down, or obliquely. When it looks from one letter to another on the Snellen test card, or from one side of a letter to another, not only the letters, but the whole line of letters and the whole card, appear to move from side to side. This apparent movement is due to the shifting of the eye and is always in a direction contrary to its movement. If one looks at the top of a letter, the letter is below the line of vision, and, therefore, appears to move downward. If one looks at the bottom, the letter is above the line of vision and appears to move upward. If one looks to the left of the letter, it is to the right of the line of vision and appears to move to the right. If one looks to the right, it is to the left of the line of vision and appears to move to the left. Persons with normal vision are rarely conscious of this illusion, and may have difficulty in demonstrating it; but in every case that has come under my observation the patients have always, in a longer or shorter time, become able to do so. When the sight is imperfect the letters may remain stationary, or even move in the same direction as the eye.

It is impossible for the eye to fix a point longer than a fraction of a second. If it tries to do so, it begins to strain and the vision is lowered. This can readily be demonstrated by trying to hold one part of a letter for an appreciable length of time. No matter how good the sight, it will begin to blur, or even disappear, very quickly, and sometimes the effort to hold it will produce pain. In the case of a few exceptional people a point may appear to be held for a considerable length of time; the subjects themselves may think that they are holding it; but this is only because the eye shifts unconsciously, the movements being so rapid that objects seem to be seen all alike simultaneously, just as the parts of a moving picture appear to be seen as one.

The shifting of the eye with normal vision is usually not conspicuous, but by direct examination with the ophthalmoscope, it can always be demonstrated. If one eye is examined with this instrument while the other is regarding a small area straight ahead, the eye being examined, which follows the movements of the other, is seen to move in various directions, from side to side, up and down, in an orbit which is usually variable. If the vision is normal, these movements are extremely rapid and unaccompanied by any appearance of effort. The shifting of the eye with imperfect sight, on the contrary, is slower, its excursions are wider and the movements are jerky and made with apparent effort.

It can also be demonstrated that the eye is capable of shifting with a rapidity which the ophthalmoscope cannot measure. The normal eye can read fourteen letters on the bottom line of a Snellen test card, at a distance of ten or fifteen feet, in a dim

light, so rapidly that they seem to be seen all at once. Yet it can be demonstrated that in order to recognize the letters under these conditions it is necessary to make about four shifts to each one. At the near point, even though one part of the letter is seen best, the rest may be seen well enough to be recognized; but at the distance, in a dim light, it is impossible to recognize the letters unless one shifts from the top to the bottom and from side to side. One must also shift from one letter to another, making about seventy shifts in a fraction of a second. A line of small letters on the Snellen test card may be less than a foot long by a quarter of an inch wide, and if it requires seventy shifts to a fraction of a second to see it apparently all at once, it must require many thousands to see an area of the size of the screen of a moving picture, with all its detail of people, animals, houses, or trees, and to see sixteen such areas to a second, as is done in viewing moving pictures, must require a rapidity of shifting that can scarcely be realized. Yet it is admitted that the present rate of taking and projecting moving pictures is too slow. The results would be more satisfactory, authorities say, if the rate were raised to twenty, twenty-two, or twenty-four a second.

The human eye and mind are not only capable of this rapidity of action, but it is only when the eye is able to shift thus rapidly that the eye and mind are at rest and the efficiency of both at their maximum. It is true that every motion of the eye produces an error of refraction; but when the movement is short this is very slight, and usually the shifts are so rapid that the error does not last long enough to be detected by the retinoscope, its existence being demonstrable only by reducing the rapidity of the movements to less than four or five a second. Hence, when the eye shifts normally no error of refraction is manifest. The more rapid the unconscious shifting of the eye the better the vision, but if one tries to be conscious of a too rapid shift a strain will be produced.

Perfect sight is impossible without continual shifting, and such shifting is a striking illustration of the mental control necessary for normal vision. It requires perfect mental control to think of thousands of things in a fraction of a second, and each point of fixation has to be thought of separately, because it is impossible to think of two things, or two parts of one thing, perfectly at the same time. The eye with imperfect sight tries to accomplish the impossible by looking fixedly at one point for an appreciable length of time, that is, by staring. When it looks at a strange letter, and does not see it, it keeps on looking at it, in an effort to see it better. Such efforts always fail, and are an important factor in the production of imperfect sight.

One of the best methods of improving the sight, therefore, is to imitate consciously the unconscious shifting of normal vision, and to realize the apparent motion produced by shifting. Whether one has imperfect or normal sight, conscious shifting and swinging are a great help and advantage to the eye; for not only may imperfect sight be improved in this way, but normal sight may also be improved.

The eye with normal sight never attempts to hold a point more than a fraction of a second, and when it shifts it always sees the previous point of fixation worse (1). When it ceases to shift rapidly, and fails to see the point shifted from worse, the sight ceases to be normal and the swing is either prevented or lengthened; occasionally it is reversed. These facts are the keynote of the treatment by shifting.

In order to see the previous point of fixation worse, the eye with imperfect sight has to look farther away from it than does the eye with normal sight. If it shifts only a quarter of an inch, for instance, it may see the previous point of fixation as well or better than before; and instead of being rested by such a shift, its strain will be increased, there will be no swing and the vision will be lowered. At a couple of inches it may be able to let go of the first point; and if neither point is held more than a fraction of a second, it will be rested by such a shift, and the illusion of swinging may be produced. The shorter the shift, the greater the benefit; but even a very long shift—as much as three feet or more—is a help to those who cannot accomplish a shorter one. When the patient is capable of a short shift, on the contrary, the long shift lowers the vision. The swing is an evidence that the shifting is being done properly; and when it occurs the vision is always improved. It is possible to shift without improvement, but it is impossible to produce the illusion of a swing without improvement, and when this can be done with a long shift the distance can be gradually reduced till the patient can shift from the top to the bottom of the smallest letter on the Snellen test card, or elsewhere, and maintain the swing. Later he may be able to be conscious of the swinging of the letters without conscious shifting.

No matter how imperfect the sight, it is always possible to shift and produce a swing, so long as the previous point of fixation is seen worse. Even diplopia and polyopia do not prevent swinging with some improvement of vision. Usually the eye with imperfect vision is able to shift from one side of the card to the other, or from a point above the large letter to a point below it, and observe that in the first case the card appears to move from side to side, while in the second the letter and the card appear to move up and down.

In some cases the eyes are under such a strain that no matter how far a patient looks away from a letter he sees it just as well, so long as he sees it at all, as if he were looking directly at it. In these extreme cases of eccentric fixation considerable ingenuity is sometimes required, first to demonstrate to the patient that he does not see best where he is looking, and then to help him to see an object worse when he looks away from it than when he looks directly at it. The use of a strong light as one of the points of fixation, or of two lights five or ten feet apart, has been found helpful. In such cases the patient, when he looks away from the light, is able to see it less bright more readily than he can see a black letter worse when he looks away from it. It then becomes easier for him to do the same thing with the letter. The highest degrees of eccen-

tric fixation occur in the high degrees of myopia, and in these cases, since the sight is best at the near point, the patient is benefitted by practising seeing worse and producing the illusion of a swing at this point. The distance can then be gradually extended until it becomes possible to do the same thing at twenty feet. Usually such patients can begin shifting at the near point with the letters of the Snellen test card, but occasionally it is necessary to use a light, or lights. In hypermetropia, too, the sight is often best at the near point, when the same methods can be used as in myopia.

After resting the eyes by closing, or by covering with the palms of the hands in such a way as to exclude all the light, shifting and swinging are often more successful. By this method of alternately resting the eyes and then shifting persons with very imperfect eyesight have sometimes obtained a temporary or permanent cure in a few weeks.

Shifting may be done slowly or rapidly, according to the state of vision. At the beginning the patient will be likely to strain if he shifts too rapidly, and then the point shifted from will not be seen worse, and there will be no swing. As improvement is made the speed can be increased. It is usually impossible, however, to realize the swing if the shifting is more rapid than two to three times a second.

A mental picture of a letter can be made to swing precisely as can a letter on the test card. For most patients mental swinging is easier at first than visual swinging, and when they become able to swing in this way it becomes easier for them to swing the letters on the test card. By alternating mental with visual swinging and shifting rapid progress is sometimes made. As relaxation becomes more perfect the swing can be shortened, until it becomes possible to conceive and swing a letter of the size of a period in a newspaper. This is easier, when it can be done, than swinging a larger letter, and many patients have derived great benefit from it.

All persons, no matter how great their error of refraction, when they shift and swing successfully, correct their error of refraction partially or completely, as demonstrated by the retinoscope, for at least a short fraction of a second. This time may be so short that the patient is not conscious of improved vision, but it is possible for him to imagine it, and then it becomes easier to maintain the relaxation long enough to become conscious of improved sight. For instance, the patient, after looking away from the card, may look back to the large letter at the top, and for a fraction of a second the error of refraction may be lessened or corrected, as demonstrated by the retinoscope. Yet he may not be conscious of improved vision. By imagining that the C is seen better, however, the moment of relaxation may be sufficiently prolonged to be realized.

When swinging, either mental or visual, is successful, the patient may become conscious of a feeling of relaxation which is manifested as a sensation of universal swinging. This sensation communicates itself to any object of which the patient is conscious. The motion may be imagined in any

part of the body to which attention is directed. It may be communicated to the chair in which the patient is sitting, or to any object in the room, or elsewhere, which is remembered. The building, the city, the whole world, in fact, may appear to be swinging. When the patient becomes conscious of this universal swinging he loses the memory of the object with which it started, but so long as he is able to maintain the movement in a direction contrary to the original movement of the eyes, or the movement imagined by the mind, relaxation is maintained. If the direction is changed, however, strain results. To imagine the universal swing with the eyes closed is easy, and some patients soon become able to do it with the eyes open. Later the feeling of relaxation which accompanies the swing may be realized without consciousness of the latter, just as the letters may swing without consciousness of the fact, but the swing can always be imagined when the patient thinks of it.

Associated with all failures to produce a swing is strain. Some people try to make the letters swing by effort. Such efforts always fail. The eyes and mind do not swing the letters; they swing of themselves. The eye can shift voluntarily. This is a muscular act resulting from a motor impulse. But the swing comes of its own accord when the shifting is normal.

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40-EAST FORTY-FIRST STREET.

NONLEUCOTOXIC PROPERTIES OF BENZYL BENZOATE.*

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Through pharmacological studies of the opium alkaloids, Macht was able to separate them into two classes: the pyridin phenanthrene group and the benzyl isoquinolin group, with morphine as the principal representative in the former and papaverin, the typical member of the latter group. He further noted that the alkaloids of the papaverin group were able to effect the relaxation of smooth muscle and were able to antagonize the tonus increasing properties of the morphine group. This relaxing effect was demonstrated to be due to benzyl grouping in their molecules and in the search for similar bodies of a simple and nonnarcotic nature, benzyl benzoate and benzyl acetate were investigated. These were found to produce the same tonus lowering effects and appeared to be eminently safe for clinical use, with the exception that the acetate was irritating when taken by mouth.

Following these investigations, benzyl benzoate has come into widespread use in nearly all conditions indicating the relaxation of smooth muscle. Because of its close chemical derivation from benzol, it has

appeared to us to be of interest and even advisable to investigate any possible analogy to the toxic effects of the latter. Though the untoward manifestations of benzol are varied, we have selected its destructive action on leucocytes as being capable of more accurate determination and comparison with the benzoate. The studies of various observers have shown the leucotoxic effect of benzol and for this reason it was formerly used as a therapeutic agent in leucemia. The problem could not be approached very well from the clinical side, since it was not justifiable to use larger doses than recommended by Macht, and because conditions could not be so thoroughly controlled as in an experimental study using animals. We have therefore used rabbits, which were the animals usually used by investigators upon benzol in the past. Certain precautions were used to ensure accuracy. That is, several preliminary leucocyte counts were made to recognize tendency to variation in the counts, since this variability exists in these animals.

The animals were then given subcutaneous injections of benzyl benzoate in equal parts of olive oil into the loose tissues of the flanks, the preparation used being the full strength benzyl benzoate and not the alcoholic dilution, which will not mix with oil. The doses used varied from one cubic centimetre to two and five tenths cubic centimetres to the kilo of body weight, these being given in one injection, with the exception that one rabbit received four doses of twenty-five hundredths c. c. each. Two rabbits were used as controls to demonstrate the destructive effects of benzol, so that comparisons could be made with the same lot of animals under similar conditions. As can be noted, the doses used were considerably larger in comparison than those used clinically. Leucocyte counts were then made daily until a tendency for the figures to remain constant was noted, and then made every other day. The results are shown in the accompanying table, and as can be noted, doses of one quarter c. c. to the kilo for four days, and doses of one, one and five tenths, two, and two and five tenths c. c. to the kilo apparently had no appreciable effect in lowering the leucocyte count. However, the animals given the largest amounts showed the ill effects of the drug by lethargy, weakness and in one case death was not preceded by leucopenia.

In contrast with these animals, the two control animals receiving benzol in doses of one and five tenths c. c. and two c. c. to the kilo, showed definite evidences of depression of the leucocyte count, which later came back to approximately normal.

For convenience in reading the table, the data concerning the various animals may be summarized as follows:

RABBIT I.—Female, weight 1,200 grams; four injections of twenty-five hundredths c. c. each of benzyl benzoate to the kilo.

RABBIT II.—Male, weight 1,500 grams; one injection of a cubic centimetre of benzyl benzoate to the kilo.

RABBIT III.—Male, weight 1,450 grams; one injection of one and five tenths c. c. of benzyl benzoate to the kilo.

RABBIT IV.—Male, weight 1,630 grams; one injection of 2 c. c. benzyl benzoate to the kilo.

RABBIT V.—Male, weight 1,350 grams; one injection of two and five tenths c. c. benzyl benzoate to the kilo.

*From the Clinical Laboratories of the Jewish Hospital.

RABBIT VI.—Male, weight 1,680 grams; one injection of one and five tenths c. c. benzol to the kilo.

RABBIT VII.—Male, weight 1,340 grams; one injection of 2 c. c. benzol to the kilo.

LEUCOCYTE COUNTS AFTER INJECTION OF BENZYL BENZOATE AND BENZOL.

Days After Injection	Rabbit No.						
	1	2	3	4	5	6	7
Preliminary	9,100	11,200	8,500	12,600	8,100	8,400	7,800
1	9,200	11,400	8,100	12,100	7,400	5,000	6,100
2	8,600	11,100	8,000	13,400	7,800	4,000	4,100
3	8,800	10,900	9,100	12,500	7,000	7,000	4,200
4	8,500	11,200	8,700	12,300	8,200	8,400	3,100
5	9,600	11,500	8,500	12,800	8,200	8,100	3,200
7	9,400	11,100	8,600	13,200	8,100	8,500	3,800
9	.....	.....	8,400	12,500	8,400	8,200	5,100
11	.....	.....	.....	dead	8,700	8,100	7,200

Rabbits 6 and 7 received benzol.

CONCLUSIONS.

1. Benzyl benzoate was found to be without toxic effects upon the leucocytes of rabbits.

2. Controls of benzol showed the well known depression of the leucocyte count.

3. A wide margin of safety is present between the therapeutic doses and the toxic doses of benzyl benzoate, based upon observations on rabbits.

LOBAR PNEUMONIA COMPLICATED BY MULTIPLE ARTHRITIS.*

Report of a Case.

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The occurrence of two or more diseases, especially of the acute febrile type, simultaneously in the same individual, is of interest because of its bearing on diagnosis, prognosis, and treatment. Early during the onset the presence of multiple infections renders a diagnosis difficult or impossible. When a diagnosis is established because of signs and symptoms characteristic of one disease, manifestations of another disease may erroneously be regarded as a complication of the first. Then, when the presence of two distinct entities is recognized, the prognosis becomes more uncertain on account of the complexity of the factors to be taken into consideration. Lastly, should there arise complications, it may be almost impossible to decide which of the diseases is responsible, which often means the difference between surgical intervention and absolute rest.

With the difficulty thus encountered in separating two diseases, and with the justifiable hesitancy one has in diagnosing two diseases when one disease may possibly account for all the symptoms, it is evident what a problem it is to estimate the frequency of such double affections. From the published reports and Board of Health figures one is led to believe them rather uncommon. Yet it is only logical to assume that many double infections are probably overlooked, because when the attention is centered on a particular disease one is likely to overlook the appearance of another, regarding it

as a complication, unless ushered in with violent or characteristic symptoms. This tendency to focus our attention on one problem only perhaps explains the comparative decrease in the incidence of ordinary diseases during the prevalence of an epidemic disease. Many of the ordinary diseases are then overlooked and are regarded as atypical cases of the epidemic disease.

From a theoretical viewpoint one may assume that in the event of two or more infectious organisms together in the same host there is a certain interrelationship, and they have either a deleterious or a beneficial effect on each other. *In vitro*, one species of organisms may have an inhibitory influence on the growth and development of the other. The reverse is true in other instances, when the presence of one organism may help the development of the other, as in the case of an aerobe, which is often necessary to facilitate the development of an anaerobe. Bacteriologists speak of it as symbiosis and enantobiosis or synergism and antagonism. Clinically, while the phenomenon of synergism may be said to be rather common, as in the case of secondary invaders in tuberculosis and streptococcus, in measles the phenomenon of antagonism is rather rare. A critical analysis of cases where double infection occurred would be interesting if such record were available. In the case here reported there seems to have been a shortening of the febrile course by the appearance of polyarthritides during the course of pneumonia.

CASE.—S. C. H., male, born in the United States. His family history was irrelevant. Previous history: He had the ordinary diseases of childhood. His habits were good; denied venereal disease. Three months previously he had had an attack of appendicitis with an abscess, for which he was operated upon at St. Francis Hospital. During his convalescence pneumonia developed (postoperative), and after that he suffered from pain in the right shoulder, which disappeared after about three weeks.

His present illness began on May 7, 1919, with a chill and fever. The patient stated that for two days previous he felt somewhat tired, but he went to work on the morning of the 7th and had to come home in the afternoon because he felt too sick to hold out longer. I saw him late that afternoon, when he had the appearance of a man acutely ill, with eyes and throat congested, face flushed, temperature 105.2°, pulse 130, respiration 20. There were no definite lung signs then except slightly diminished breathing and relative dullness at left base, with a few sibilant râles at right base. The next day there were signs of lobar pneumonia at the left base posteriorly and in the left axilla. The temperature remained at about 104.5°, and pulse about 120. The respiration became more frequent, between 35 and 40. The blood count at that time was 30,000, with eighty polymorphonuclears and twenty lymphocytes. The urine contained a slight amount of albumin, but no casts, pus, or blood. Sputum was blood tinged and later became rusty. A culture of sputum showed the predominating organism to be Type IV.

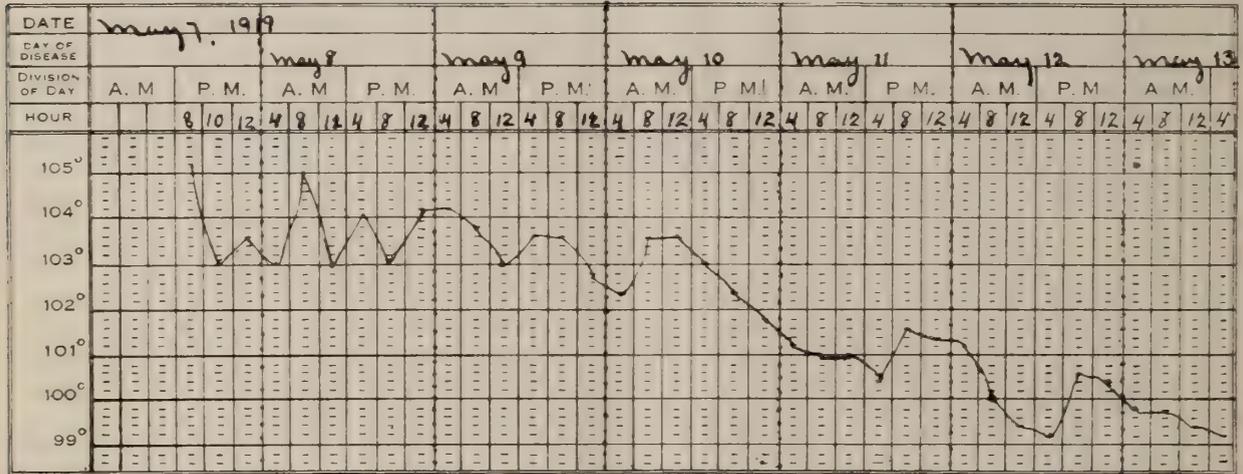
*Read before the Alumni of the Lebanon Hospital, New York, March 2, 1920.

On the third day of illness the patient's condition was very serious. He had signs of extensive involvement of the entire lower and part of upper left lungs, as well as a small patch over right angle of scapula. He was cyanotic and there were some moist râles over both lungs. He was given atropine and digalen intravenously. Toward evening some pain in the left shoulder developed which was thought to be the result of extensive pleuritic involvement.

The following day the patient complained of pain in his left knee, and later in the day, in the right ankle. On examination, the ankle and knee were found to be red, swollen, and tender. About the same time the temperature began to fall, and

kles, both knees, both elbows, the left hip, left shoulder, and left first and right second metacarpophalangeal joints had been involved. During the course there were also present small areas of erythematous patches around these joints. They were thickened and tender and varied in size from one to three cm. The patient eventually recovered completely.

In the case here reported there seems to have been a decided shortening of the usual acute course in lobar pneumonia. A glance at the temperature chart shows a drop in the fever coincident with the appearance of articular symptoms, although there was no change in the physical signs in the lungs at that time. This calls to mind the recent attempts



CHART—Temperature chart of S. C. H.

in twenty-four hours was 100.2°. The left elbow and right shoulder became red and swollen next day. The whole clinical picture was that of an acute polyarthritis of rheumatic origin. There was marked redness, much tenderness and swelling and inability to move the joints, either actively or passively. When the first joints became involved there was a doubt as to whether we were dealing with a pneumococcus arthritis. The blood count, which had gone up then to 48,000, with eighty-three polymorphonuclears, would have been in favor of that assumption. However, the patient looked much better despite his joint involvement. The subsequent manifestations in other joints and the ready response to salicylates eliminated pneumococcus arthritis, which is usually monoarticular, is associated with a septic temperature, and does not respond to salicylates.

The course of the pneumonia was rather unusual. After the temperature became normal the extensive lung signs remained about the same from nine to ten days, when signs of resolution slowly began to appear. At the end of about three weeks the patient still had some dullness over the left base posteriorly.

The joint manifestations ran a clinical course typical of an ordinary attack of acute articular rheumatism. The migratory tendency of the joint involvement was very decided. Within a week after the first appearance of the arthritis both an-

that have been made to shorten the course of certain diseases by the introduction of nonspecific bacteria, such as polyvalent vaccines intravenously. The success with chronic arthritis in the hands of some observers by the intravenous injection of typhoid vaccines received considerable attention four or five years ago, and only last year there were similar attempts made to influence the course of influenza by the injection of streptococci and staphylococci, in order to raise or bring about a leucocytosis. Certainly, some of the favorable results that some observers claim to have obtained by polyvalent vaccines, or sera, and phylacogens, may not be entirely due to a nonspecific protein reaction, but may, in some measure, be due to the phenomenon of symbiosis and enantobiosis. It would be worth while to study this subject from a clinical as well as a bacteriological viewpoint.

1220 GRAND CONCOURSE.

Syphilis and Pregnancy.—William J. Young (*Surgery, Gynecology and Obstetrics*, May, 1920) in a study of syphilis and pregnancy came to the following conclusions: Routine Wassermann examination should be made in obstetrical wards of charity institutions when patients are admitted. It should be just as much the duty of the obstetrician to ascertain evidence or history of lues in his patient as to conduct delivery.

LONDON LETTER

*(From our own correspondent)**Venerable Disease Clinics and Professional Secrecy.—Next Year's Census.—Dinner to Sir George Watkins.*

LONDON, May 22, 1920.

In other chapters the commission dealt with the problems of infant mortality, and conspicuous contributory causes of loss of population as, for example, venereal disease and alcoholism. With respect to the treatment of venereal disease they record their opinion that taking into consideration the gravity of the situation, the Ministry of Health would be justified in calling the attention of the public to the fact that abstinence from promiscuous intercourse is the only thoroughly effective method of preventing the spread of disease, and that it is the urgent duty of every citizen who, in disregard of the claims of morality and citizenship, exposes himself to the risk of infection, to use some method of disinfection either personal or by private medical treatment or by attendance at an early treatment centre at the earliest opportunity. Further, if on later investigation the methods of self-disinfection should prove to be more effectual in preventing the spread of venereal disease than the methods of disinfection at early treatment centres, then the National Birth Rate Commission think that any difficulties of an administrative kind which may now prevent registered chemists from selling such disinfectants should be removed, provided such preparations are only to be sold when accompanied by a notice that they are to be used for disinfection only and are useless for treatment.

The report commented on is an exceedingly valuable one, inasmuch as it discusses with the utmost frankness the two outstanding obstacles to a fruitful birth rate. Also it may be noted the suggestions and findings of the commission apply with almost equal force to America as to this country. Birth restriction is prevalent in all civilized countries, and of course, America is not exempt. The most deplorable feature of the case is that it is a survival of the least fit, or, at any rate, not of the most fit. The class that is most likely to bring forth progeny of the type from which the most desirable citizen is evolved, refuse to have even decent sized families. The inexorable consequence must be that if such a course be continued, the undesirable class will predominate and will swamp the desirable class and will rule the world. This is a very serious situation and one which must be squarely and resolutely faced.

Dr. Addison, the Minister of Health, received at the office of the Ministry on May 6th, last, a deputation from the London and Counties Medical Protection Society, Ltd. The chairman of the London and Counties Protection Society Dr. C. M. Fegen, on behalf of the deputation, urged upon the Minister of Health, the necessity for early legislation to protect the medical officers of venereal disease clinics from being compelled in the witnessbox to violate the established principles of professional secrecy, and to give information of their patients' ailments and of anything else which came to their knowledge in their professional capacity. He said that the

medical officers of venereal clinics were being compelled in the law courts, under penalty of imprisonment for contempt of court, to reveal what their patients had communicated to them, believing that the information would be regarded as absolutely confidential. It was pointed out that the effect of this would be disastrous to the working of the venereal disease clinics. The Minister of Health expressed his complete concurrence with the views of the deputation, and promised to do what he could to promote legislation as suggested by the deputation. He said, moreover, that he felt certain that public opinion would support the maintenance of professional secrecy in connection with venereal disease clinics.

* * *

In 1921 the decennial census of Great Britain is to be taken. Viscount Astor, secretary to the Ministry of Health, has introduced into the House of Lords a bill making the necessary provision for the purpose. Hitherto, it has been necessary to pass a bill on the occasion of each enumeration, but should the present measure become law, special legislation will be dispensed with in future, and the necessary arrangements will be provided for by order in council. Power is also sought to direct the taking of a census every five years. In future enumerations British householders will be required to state the following particulars: 1. Names, sex, age. 2. Occupation, profession, trade or employment. 3. Nationality, birthplace, race, language. 4. Place of abode and character of dwelling. 5. Education. 6. Infirmity or disability. 7. Condition as to marriage, relation to head of family, parentage, issue. 8. Any other matters with respect to which it is desirable to obtain statistical information with a view to ascertaining the social or civil condition of the population. Provision is made for the enumeration to be carried out by the Registrar General under the direction of the Minister of Health, and for the issue of regulations prescribing the procedure to be followed.

* * *

A complimentary dinner to Sir George Watkins, president of the Royal College of Surgeons, and late consulting surgeon to the British Expeditionary Forces, was held in the Hotel Great Central, London, on the evening of May 10th, last. A large company was present, including Sir John Goodwin, Director General of the Army Medical Department; Sir James Porter, late Director General of the Naval Medical Services; Sir John Bland Sutton, vice-president of the Royal College of Surgeons; Sir William Fletcher, representing the Medical Research Council; Sir John MacAlister, for the Royal Society of Medicine; Dr. Alfred Cox, for the British Medical Association and Mr. F. G. Hazzett, for the Conjoint Examination Board of the Royal Colleges. Sir Cuthbert Wallace gave the toast of the evening which was seconded, if such a term is applicable, by no fewer than four persons, Sir John Goodwin, Mr. E. F. White, Sir John Bland Sutton and Sir George Savage, the well known alienist, who in the course of his speech gave a humorous sketch of Bedlam some forty years ago. The dinner was a success from all points of view.

Editorial Notes and Comments

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SCIENCE AND IMAGINATION.

While it is true that scientific knowledge represents the grasping of hard facts, this by no means signifies that the scientific man should be devoid of imagination or that imagination has no place in the building of science. The discoverer, the pioneer of science, is notoriously a man of imagination or he would not be a discoverer. His is the speculative mind; he theorizes and then sets himself to prove that his theories are right. In his remarkably able and fascinating address a few weeks ago as president of the British Medical Association, that grand old man of medicine, Sir T. Clifford Allbutt, regretted the fact that the schools are teaching too much detail, and that the universities do not stimulate the imagination as in times gone by. The true scientist is born, not made; a person can have an absolutely scientific mind without knowing one science and conversely an individual can have a hopelessly unscientific mind although his brain may be gorged with scientific facts. Accurate knowledge is essential, but the gaining of such knowledge may be carried too far and become narrow specialization, exact knowledge on one subject, but no broad outlook. The human mind does not need monuments of laborious research so much as the play of imagination of the master mind which regards the subject as a whole. Therefore Sir Clifford insisted that science and imagination should go hand in hand and that detail should be the complement of imagination. It is obvious that science cannot make great progress without the aid of imagination. The highest

type of man is the theoretical and contemplative, and he only reaches perfection when these gifts are allied with the genius for bringing them into effect.

The imaginative genius frequently lacks the practical instinct and must rely on the common sense plodder to reduce his theories to utilitarian purposes. But the imaginative man is essential if scientific medicine is to continue to advance, and consequently the warning to the modern schools and universities not to dwell too much on detail but to leave plenty of scope for the exercise of the imagination is altogether justified.

VACATION TIME.

During evolutionary processes man tries to fit into the various niches which are created through his own efforts. At times progress is more rapid in one field than another and it requires great effort to maintain a balance. During all this manipulation the struggle for existence makes itself manifest by the continuous grind to which we are subjected. The physician is especially aware of these factors which he must face. He is required to fit himself into the modern world with its rapidly changing molds, to struggle along in a competitive race to make his living, serve mankind by administering to the sick, making his own adjustments. In this constant striving he is obliged to observe and give back to medicine his own findings and so pay his debt to science. He is obliged to study the findings of other men, making use of them for the benefit of his patients.

Frequently the medical man does not realize in the course of his constant endeavor to alleviate suffering that he owes to himself a period of rest and recuperation. His responsibilities are greater, however, than those of many other workers, for he cannot stop the incidence of disease while he leaves his practice and seeks a retreat from its cares and anxieties. From time to time, however, he should think of the duty he owes to himself. We have found that the ideal condition for the human body is alternate work and rest. This holds also for the mind. Many physicians do more reading during their vacation time than during the rest of the year. Many of them who do not have time for study during the busy months of active practice take the opportunity for study. They review the literature that has accumulated and in the peace and quiet of the country they can assimilate and make use of the material they find. To be

able to cast aside the responsibilities of their everyday tasks and revel in the medical literature constitutes a real vacation for these men. They are refreshed and return to their work with a new vigor. Other physicians, who are able to combine their studies with their practical work, require a change which they find in the more vigorous out of door sports, and the most exciting thing many of them do during their vacation days is to lie on the banks of some quiet stream tending a fishing rod and dreaming of the time they ran away from school to enjoy a similar day's sport.

In any event, the physician is entitled to a vacation. He deserves it and owes it to himself and to his patients. He returns to his work with a new outlook upon life and can give more of himself, for the life of the physician, more than that of any other occupation, consists in giving. But he must keep himself fit, in body and in mind.

THE TREATMENT OF VOMITING IN NURSLINGS.

A problem of almost daily occurrence to be solved by the physician is that of the treatment of vomiting in nursing infants. In the first place regurgitation, where the infant rejects the excess of milk which it has ingested, must not be mistaken for vomiting. This takes place immediately after nursing, the milk rejected being liquid and without any change having occurred. Vomiting arises some time after nursing and the milk is coagulated. In the newly born hematemesis, melena and incoercible vomiting due to pyloric stenosis or from a congenital intolerance for all kinds of milk are encountered. These cases are exceptional, so that the vomiting due to an alimentary cause or to some intrinsic pathological factor alone will be considered. In the former the vomiting is produced either by irregularity in feeding, by overfeeding or underfeeding or something defective in the food. The causes are to be looked for in the hygiene or defective diet of the infant, its general state of health and in a too great richness of butter or casein in the milk. If the child is bottle fed the cause may be bad feeding of the cow furnishing the milk, various changes of the milk occurring during transportation or to uncleanliness of the instruments—bottle and rubber nipple—or an excess of butter or casein.

In a weaned infant the abuse of feculents may lead to the same result, like any other food disproportionate to the age of the child. Various pathological states may produce vomiting. Thus it is in affections of the digestive tract—dyspepsia, enteritis, infantile cholera, appendicitis, intestinal oc-

clusion or invagination, hernia and affections of other systems—meningitis, encephalitis, various infectious states, etc. If the infant is breast fed the feedings should be regulated and given at proper intervals, frequent if there is reason to suppose that the baby is underfed. The health and diet of the nurse must be examined into and an analysis of the milk should always be made when the vomiting persists. Before each feeding a teaspoonful of the nurse's milk should be given to which has been added a pinch of chymosin, pepsin or lab ferment. Maternal milk should not be regarded defective until the sterile milk test has been made. Stop maternal feeding for two days, during which time the nursing is fed on cow's milk properly diluted and sugared; if the vomiting ceases or decreases it is due to the nurse's milk.

If the infant is bottle fed the origin of the milk must be watched, as well as cleanliness of the bottles and nipples. Aerophagy is avoided by holding the bottle so that the neck is always filled with milk during the feeding. After the fourth month begin to concentrate the milk according to the infant's tolerance. Light vegetable broth and maltose bouillon can also be given. Anhydric diet is indicated in vomiting resulting from acute diseases for twelve to twenty-four hours and should it still persist a dry diet may be resorted to for two or three days. If the baby is weaned the feedings must be regulated and the abuse of feculents, meat and fats avoided. Other therapeutic measures such as hot packs over the epigastric region can be applied in appendicitis, while if the vomitus has a butyric odor or if there is a gastrointestinal intoxication, gastric lavage may be done. A teaspoonful of sodium citrate or dilute hydrochloric acid in proper dose can be given before each feeding. Operation is urgently required if the case is one of pyloric stenosis, appendicitis or invagination.

INSOMNIA DUE TO DYSPEPTIC STATES.

Dyspeptic subjects frequently suffer from disagreeable forms of insomnia presenting certain characteristics which individualize them and facilitate their diagnosis. In these forms of insomnia the patients are nervous, overwrought, and in a state of depression quite incompatible with a normal life. In the end a true neuropathic condition exists.

There are three principal varieties of insomnia due to digestive disturbances. In the first and most common form the patient falls asleep easily but is awakened regularly at a certain hour by a gastric paroxysm, accompanied by pain, pyrosis,

and belching, sometimes relieved by a change of position. This pain follows the movements of the patients to a certain extent and becomes localized on the side upon which they lie. It is sufficiently severe to prevent sleep and only subsides toward morning, allowing the patient to fall into a heavy sleep from which he arises in a state of fatigue, without energy, possibly suffering from vertigo, and quite incapable of physical or intellectual effort.

In the second variety of insomnia, the patient always experiences, at about the same hour every night, a feeling of malaise which seems in no way to be due to the stomach. After a period of restlessness, haunted by disagreeable dreams, he awakens, drenched with perspiration, with a rapid pulse, a difficult, anxious respiration, and a sensation of distress and painful weight in the cardiac region. Assuming the sitting posture and belching up considerable gas affords some relief, but the patient is often unable to fall asleep for hours, and as a consequence in the morning he is fagged out and only by the greatest effort is able to leave his bed.

In the third variety the patients are wakeful all night and lose consciousness only during brief periods. The best way to prevent these cases of insomnia, which are frequently encountered in practice and often misunderstood, as well as the nervous states engendered thereby, is to treat the digestive disturbances which are the underlying cause.

COMMERCE AND PSYCHOLOGY.

A few years ago a narrow minded commercial man would have enjoyed an article which recently appeared in a New York paper on the mistakes and failures, even the cruelty, of those doctors who undespairingly wrestle against tuberculosis. "Waste of time; waste of Government funds," his comment. Today he pricks up his ears; psychology can teach him how to get the best value from employees; can save him many a compensation and pension. Here is one of his helpers, a gentleman who puts E. P. R. I. after his name, which simply means he is an employment psychologist in the rubber industry, and the results of his work are an enormous saving to the company. This is explained in the *Journal of Applied Psychology* for March, 1920.

But those who cannot appreciate the ramifications of medical science certainly will not understand the work which is being added yearly to the tired doctors' crowded day. Indirectly, even the general practitioner must be able to meet and discuss cases with a real or partly assumed interest. He must agree with or fight the law court verdict as to mental conditions, and a dual personality case in an employee does not mean a dual fee; perhaps, even none at all.

CANADA'S WORK FOR DISABLED SOLDIERS.

In a splendid pamphlet just published by the Department of Soldiers' Civil Reestablishment, in Ottawa, is described the work that is being done for the disabled soldiers in Canada. From a careful reading of the book it will be seen that this work has been done with energy and thoroughness. No department has been neglected. Careful attention has been given to the physiotherapeutic fields, a branch of therapeutics which has come to the fore during the war, showing that more progress can be made by carefully directed physical methods than by surgery or medicine. In fact, it has grown to be one of the most dependable and most widely used methods of treatment.

The work done has been of a very high order and every effort made to secure comfortable and cheerful surroundings for the men. Many needs have received attention that were neglected in former postwar methods of treatment. Modern dentistry has received the attention it deserves. Workers in this field will read this valuable book with a feeling of great satisfaction.

News Items.

Virginia Medical Meeting.—The Medical Society of Virginia will hold its next meeting October 26th to 29th in Petersburg.

Married.—Dr. Albert Ernest Gallant, of Forest Hills, N. Y., and Mrs. Mary Claire Parsons were married June 14th. They will live in Forest Hills.

Death of Dr. Zander.—Dr. Gustav Zander, the originator of the Zander system of mechanical therapeutics, is dead at Stockholm at the age of eighty-five.

Proposed American Hospital in Philippines.—A campaign to raise funds for the establishment of an American hospital is being conducted by American residents of the Philippines.

Royal College of Surgeons Elects Officers.—Sir Anthony Bowlby has been elected president and Sir Charles A. Ballance and Sir John Bland have been elected vice-presidents of the Royal College of Surgeons.

Italian Congress of Medical Radiology.—A congress under the auspices of the Societe Italiana di Radiologia Medica will be held October 28th to 30th in Rome, under the presidency of Professor Francesco Ghilarducci.

Appointment of Dr. Geiger.—Dr. Jacob Geiger has been appointed director of the pathological laboratories of the New York Diagnostic Clinics and after a survey of the better American laboratories will reorganize the present laboratories of this institution.

Dinner to Dr. Mayo.—A dinner was held in London on Tuesday, July 6th, with the double object of honoring Dr. Charles H. Mayo and of introducing to public notice the movement for founding an American Hospital. The speakers included Lord Reading, Dr. Mayo, Mr. Balfour, Mr. John W. Davis, and Sir Arbuthnot Lane.

Major General Gorgas to Lie in Arlington.—The body of Major General Gorgas, who died recently in London, will be buried in Arlington National Cemetery.

Appropriation to Fight Disease.—An appropriation of \$80,000 has been made to the New York City Health Department by the Board of Estimate for the purpose of preventing the invasion of cholera, bubonic plague, smallpox, and typhus, which are now ravaging sections of Europe.

Iowa Medical Meeting.—The Iowa State Medical Society held its sixty-ninth annual meeting May 12th to 14th in Des Moines. The following officers were elected: President, Dr. Alanson M. Pond, of Dubuque; vice-presidents, Dr. C. P. Howard, of Iowa City; Dr. J. W. Osborn, of Des Moines. The next meeting will be held in Des Moines.

Ontario Medical Meeting.—The Ontario Medical Association at a meeting held the latter part of May elected the following officers: President, Dr. J. H. Mullin, of Hamilton; vice-presidents, Dr. F. J. Farley, of Trenton, and Dr. F. A. Clarkson, of Toronto; secretary, Dr. T. G. Routley, of Toronto; treasurer, Dr. G. Stewart Cameron, of Peterboro.

Medical Society of Northern Virginia and the District of Columbia.—At a meeting held at Alexandria on May 19th this society elected the following officers: President, Dr. George Tully Vaughan, Washington; vice-president, Dr. Arthur Hooe, Washington; recording secretary, Dr. William T. Davis, Washington; corresponding secretary, Dr. Joseph D. Rogers, Washington; treasurer, Dr. Robert S. Lamb, Washington.

Arkansas Medical Society.—The Arkansas State Medical Association met recently in Eureka Springs and elected the following officers: President, Dr. G. A. Warren, of Black Rock; vice-presidents, Dr. Robert H. Huntington, of Eureka Springs; Dr. A. J. Clinton, of Lockesburg, and Dr. Thad Cothorn, of Jonesboro; secretary editor, Dr. William R. Bathurst, of Little Rock (reelected); treasurer, Dr. Henry R. Kirby, of Little Rock. The next meeting will be held in Hot Springs.

Virginia Commission on Medical Education.—The following medical men have been appointed to the Commission on Medical Education in Virginia, the body which has been created to make recommendations leading to the establishment of a single state supported medical school in Virginia: Dr. Beverley R. Tucker, of Richmond; Dr. James H. Dillard, of Charlottesville; Dr. Julian A. Burrus, of Blacksburg; Dr. Stuart McGuire, of Richmond, and Dr. Theodore Hough, University of Virginia.

Massachusetts Central Health Council.—A Central Health Council for the purpose of promoting cooperation between the various health agencies throughout the state has been organized in Massachusetts. In the new organization are represented public health nursing, child welfare, medical and dental groups, tuberculosis, cancer, state and local health officials, the Red Cross, and the American Public Health Association. Dr. Enos H. Bigelow, of Framingham, is president. It is expected that by means of this organization duplication and overlapping of duties may be eliminated.

Police Department Sanitarium.—Plans are under way for the erection of a sanitarium in the Catskills or in the Adirondacks for members of the New York City police department who become ill.

United Hospitals Report.—According to an announcement by a member of the executive committee, the United Hospitals Fund of New York last year provided 2,438,811 hospital days, of which 1,203,728 were free days. Free treatment was given to 698,335 persons.

Sanitary Code Amended to Prevent Anthrax.—The Sanitary Code of New York City has been amended to provide for sterilization of hair used in toilet articles, in order to prevent anthrax. The sterilization must be according to rules laid down by the Board of Health.

Complete Medical Course at Wisconsin University.—The medical course of the University of Wisconsin, heretofore only two years, will be expanded to a complete four year course, by the terms of legislation recently enacted. The teaching of the third year will probably be offered in the fall of 1923 and that of the fourth year in the fall of 1924. A state hospital will also be established at Madison.

United States Civil Service.—The United States Civil Service Commission announces examinations on December 1, 1920, for the positions of bacteriologist at \$130 to \$180 a month, associate bacteriologist at \$90 to \$130 a month, assistant bacteriologist at \$70 to \$90 a month, junior bacteriologist at \$70 a month, and junior bacteriologist (part time) at \$30 to \$50 a month. Announcement is also made of an examination on August 31st for the position of pharmacologist in the Public Health Service, at \$3,000 a year.

Died.

BRANDENBURG.—In New York, N. Y., on Saturday, July 17th, Dr. Charles Wesley Brandenburg, aged sixty-nine years.

CAMPBELL.—In New York, N. Y., on Sunday, July 25th, Dr. Harry E. Campbell, of Pittsburgh, Pa., aged sixty-one years.

COOK.—In West Stockholm, N. Y., on Friday, July 9th, Dr. Martin Dutton Cook, aged eighty years.

EIDENMULLER.—In San Francisco, Cal., on Saturday, July 10th, Dr. William Cooper Eidenmuller, aged sixty-four years.

FLAGG.—In Hyde Park, Vt., on Friday, July 9th, Dr. Rowley Smith Flagg, aged thirty-two years.

KINMOUTH.—In Belmar, N. J., on Wednesday, July 21st, Dr. Hugh S. Kinmouth, aged seventy-three years.

LESTER.—In Seneca Falls, N. Y., on Sunday, July 18th, Dr. Elias Lester, aged eighty-four years.

LONG.—In Haddonfield, N. J., on Wednesday, July 14th, Dr. William Sumner Long, aged sixty-five years.

MCCURDY.—In Bangor, Me., on Thursday, July 8th, Dr. Charles L. McCurdy, aged sixty-six years.

PARKER.—In Willimantic, Conn., on Saturday, July 17th, Dr. Theodore Raymond Parker, aged sixty-four years.

PARSONNET.—In Newark, N. J., on Tuesday, July 20th, Dr. Victor Parsonnet, aged forty-nine years.

SMITH.—In Bridgeport, Conn., on Wednesday, July 14th, Dr. Edwards M. Smith, aged sixty years.

VAN WERT.—In New York, N. Y., on Sunday, July 25th, Dr. John Irving Van Wert, of Patton, Pa., aged fifty-five years.

Book Reviews

FOLKLORE IN THE OLD TESTAMENT.

Folklore in the Old Testament. Studies in Comparative Religion, Legend and Law. By Sir JAMES GEORGE FRAZER, Hon. D. C. L., Oxford; Hon. LL.D., Glasgow; Hon. Litt. D., Durham Fellow of Trinity College, Cambridge. In Three Volumes. London: Macmillan and Company, Limited, 1919. Pp. xxv-569; xxi-569; xviii-566.

"The proper study of mankind is man." Man is no less the proper study of that branch of human interests which pertains to the discovery and the maintenance of the principles upon which his health rests, namely medicine. Sir James G. Frazer has been one of the chief servants in the past in furnishing an extensive background for any branch of study of man's needs, a background whose chief theme has been man and man only. For his works are concerned with gathered material from the records of humanity itself, records engraved in folklore, custom, superstition, religious belief and practice, in the actions and modes of thought discoverable among all races and all conditions of men still to be found upon the face of the earth and in whatever traces of former times.

Psychological medicine at least has come to find such material indispensable in investigation of the reactions, the archaic modes of thought and feeling, the residue of experiences which still linger in the unconscious of each individual. These have left their mark in deeply fixed tendencies which lie in the hidden mental life of man and play an enormous part in determining outer reactions, still influencing man's attempts to deal with the social world in which he lives today. Frazer himself says in the preface to these recent volumes: "The instrument for the detection of savagery under civilization is the comparative method, which, applied to the human mind, enables us to trace man's intellectual and moral evolution, just as, applied to the human body, it enables us to trace his physical evolution from lower forms of animal life. There is, in short, a comparative anatomy of the mind as well as of the body, and it promises to be no less fruitful of far-reaching consequences, not merely speculative but practical, for the future of humanity."

The author has at his command such a vast amount of this material gathered and sorted and compared by him through many years of scholarly work that he can bring to bear an overwhelming force of fact upon any theme of man's development and man's interest which he chooses as his starting point. The title of these volumes suggests at once a pathway into human history where the comparative method must yield rich results and at the same time grant new and deeper appreciation of the introductory topics themselves. These belong to the ancient Hebrew religion, which in its turn is of fundamental interest to all Christendom. From the study of these topics there comes an illumination of still more fundamental psychological facts out of which these larger formulas of religion have sprung. The author's spirit of reverent appreciation of truths and modes of thought and belief which have rendered tremendous service to

humanity, as well as his fearless seeking of the fundamental human psychology underneath, are warrant for the true value of these books. He has moreover a literary style of more than usual grace and beauty which has its basis in a genuine spirit of kindly constructive comparison and criticism, an ability not only to see two sides of a question but to bring these harmoniously into a mutual service in the search for underlying fact. Through all this there runs a bubbling stream of humor which lends to the reader a quicker appreciation of the absurdities and false logic of much of the primitive affective form of thinking and the results to which such thinking leads. At the same time it makes the reader more tolerant, reaching as it does unawares into his unconscious sympathy with the infantile reactions of our ancestors. When we consider the etiological factors our judgments are tempered.

Frazer has taken for the arrangement of his work certain important or certain strangely obscure topics pertaining to the Old Testament religion and then has given himself license to range freely over the face of the earth for similar material. He thus illustrates the fuller meaning of these things as they lie in the origin and development of the Hebrew faith. He shows the inherent value and significance of these factors as they appear different merely in outward form in the religions and customs, the hopes and fears, of men over the wide world and through different times. Thus he also clears up many an obscurity and gives meaning where the original pragmatic value had been covered over through the distortions of reinterpretation and redirection of the underlying significance.

For the literary and the theological critic he has an interesting opening discussion of the twofold record embodied in the Old Testament, the earlier traditional one, the more picturesque, rich in redolent folklore, as Frazer himself describes it, and the later intellectualized version of the same material made by the priestly cult. He discusses the creation and fall of man with the participation of the serpent in the latter, his bringing of the message, the fatal interpretation of which led to death, to all of which rich parallels are found in widely different parts of the earth. The discussion of the mark put upon Cain and the reason for this mark is a significant chapter for the earliest history of legal conceptions and the faint foreshadowings of legal code.

Comparative study leaves the reader with a far different regard for Cain and a very different understanding of his position in early society than the orthodox theological or legal one would afford. Some confusing discrepancies in the narrative are also resolved when we learn that Jehovah was really kindly disposed to Cain, this "first Mr. Smith, for Cain means Smith," as the author considerably tells us. He was probably protected by the mark set upon him from his victim's ghost, not branded with a sign of frightfulness and shame, the former according better with the primitive estimate of a murderer's status in society. Feeling is

altered also in regard to the apparent scheming of Jacob against his older brother when it is learned that there was once a widespread existence of ultimogeniture which preceded the custom of primogeniture known to more recent society. The latter has been so long accepted that the memory of a reverse principle in society has fallen to the level of the distorted tale by which Jacob's character has long been defamed.

Great interest attaches to the comparative study of the legend of the flood. This long chapter is a reprint of the annual Huxley lecture delivered by the author and therefore is especially characterized by the writer's charm of literary production, his gracious handling of opposing views, his delicate humor with which he makes merry with his readers, though never discourteously to the childish thinkers of the past, over their infantile type of thought and narrative which he in such manner more fully reveals. This chapter would form a valuable monograph in itself upon a much investigated, much contested subject and one upon which Frazer's studies yield vast stores of material illustrative of unconscious modes of thought and the content of this deeper mental life. Perhaps still more important in questions of medical psychology, in the light of Freud's investigations in the relations of the individual to the family group, is the extensive chapter dealing with the slow development of social feeling and custom in regard to cousin marriages and the marriage of a wife's sister or of a deceased brother's wife. These subjects are introduced by the pastoral tale of Jacob's wooing of the two sisters, Leah and Rachel, the older necessarily before the younger more desired one. The chapter consists of a long discussion of the gradual alteration of social feeling and custom in regard to these marriages. It is full of illustrative material but falls almost into the category of extremely technical matter, for the details which regulate and belong to these customs among different peoples and at different times, as social feeling and custom pass from one stage to another, would require special time and application for their study. It forms nevertheless a valuable chapter for such reference and in its general revelations throws light upon the problems lying within the present day unconscious "family complex" with its place in social history as well as in individual conflict.

The literary background in which all these collected details of comparative matter are woven together, through the author's ripe scholarship and power as a writer, is never one to tempt to idle self enjoyment. It stimulates to thought and speculation of many sorts. He revives a fading interest in the Old Testament, one which ought not to pass away but one which should grow to a wider and deeper appreciation of its stores of material because of his treatment. Frazer's three volumes deserve a place on the shelves of the library, those shelves which stand closest to the retreat of an idle hour and those most accessible for the busy student. They should form part of the indispensable equipment of the special worker in the mysteries and complexities of the mental disturbances of the men and women of today.

IRISH FOLKLORE.

Visions and Beliefs in the West of Ireland. Collected and Arranged by Lady Gregory. With Two Essays and Notes by W. B. Yeats. In Two Series. Illustrated. New York and London: G. P. Putnam's Sons (The Knickerbocker Press), 1920. Pp. vii-293; iii-343.

Oh, to live in the enchanted land of Ireland, to share the hospitable mood of its people which freely welcomes to their daily life the strange images of the dream world! One can steep oneself in Lady Gregory's volumes until the partitions between this world and some other are fairly dissolved—for the moment, until one again awakes. It is perhaps too bad that most of us on both sides of the Atlantic have been so trained in scientific thought, we have kept ourselves so well afloat in the world of logical sequence, because it seemed useful and workable so to do, that we cannot be satisfied with continual wandering on such uncertain boundaries. Some advanced thinkers have even dug out from the workings of the human mind a single unifying formula, they call it "wish fulfilment," which sets all these strange beings to scampering into the realm of unsubstantiality and accounts for all their strange forms and trickeries. Mr. Yeats in his labored comments has no such simple satisfying explanation. His attempts to explain and to locate these beings, essences, whatever they may be, show a lack of logic which may satisfy a puerile animistic style of thinking but which hardly accords with the simple, logical directness of evolution. Cause as a fundamental background gradually unfolding out of itself has no place for him. Therefore he tells us only that souls, spiritual beings, exist and take any shape they will and appear as and how they will. Yet sometimes they are limited and forced to other, or partly other appearances, a confusion of shapes. Is this evolutionary logic?

Although the Irish know it not they are oftener nearer to the more simple scientific formula than that. "They can do nothing without some live person is looking at them." "It is something in our own eyes makes them big or little." They all but acknowledge the root of wish fulfilment or its distortion. Of the latter the mind permitting a wish to come through from the uncritical unconscious into the light of conscious requirements is easily capable. No wonder, if these visions and beliefs are products of their own minds, that they take familiar shape and form, manifest desires similar to those of their creators. The latter lead a hard existence with an absence or a severe limitation of the joys and beauties they so often ascribe to these beings. It is not a peculiarity of the Irish to be able to dream and express their desires thus even in waking belief in these dreams. "There's no doubt at all but that there's the same sort of things in other countries; but you hear more about them in these parts because the Irish do be more familiar in talking of them." Not only so but they have maintained to an unusual degree a childlike spirit of beauty and delight, as an ambivalence toward their environment. At all events they hold to the kindly and lovely side of these beings and ascribe to even the distorted, ugly forms a desire to do no harm except under provocation. They give testimony frequently in their

own statement of their belief, to which Lady Gregory has adhered throughout, to various phases of mental condition in which deliria and dreams are prominent. There are the periods of being "away," suggestions of epileptic or other fits, and the not inquent "drop too much." Stress of loss of dear ones plays a large part. The two volumes form a rich and charming addition to the study of the products of the vast unconscious world of phantasy which forms the greater part of all of us and to the peculiar power of all, particularly of this race, to project the unconscious material outside the self and there reinterpret it. There is shrewd testimony on the part of some of the harder hearted, more realistic inhabitants, "Walking Coole demesne I am these forty years, days and nights, and never met anything worse than myself." Have we or shall we ever, any of us?

TRAVEL FOR THOSE WHO STAY AT HOME.

White Shadows in the South Seas. By FREDERICK O'BRIEN. With many illustrations from photographs. New York: The Century Company, 1919. Pp. iii-450.

Thirty-seven days' sail from Tahiti lie the Marquesas, those tragic islands of the South Seas where the last members of a race are dying. "Here in these islands," says the author, "the brothers of our long forgotten ancestors have lived and bred since the Stone Age, cut off from the main stream of mankind's development. Here they have kept the childhood customs of our white race, savage and wild, amid their primitive and savage life. Here, three centuries ago, they were discovered by the people of the great world, and rudely encountering a civilization they did not build, they are dying here." There is much of easy, simple living in these islands; there are many "sun-steeped days on white beaches," but there is also much of degradation. A hundred years ago there were 160,000 Marquesans; the number today is estimated by the author at less than 2,100. Tuberculosis and taxes, smallpox and syphilis, leprosy and opium, the cupidity of the trader and the strange gods of the missionary have been brought to the islands by the white men, and the Polynesian is dying under them. As Titihuti, she of the tattooed legs, says: "We will all be gone soon, and the coconut groves of our islands will know us no more. We come, we do not know whence, and we go, we do not know where. Only the sea endures, and it does not remember."

The reader who elects to journey with Mr. O'Brien will be well repaid, for this book is different from most travelers' tales. It is not scenery or customs or atmosphere that the author is trying to reproduce, but the life of which these form a part, and life in the Marquesas is shot through with simplicity and beauty and melancholy. Our white author, with his *Golden Bed* and *The Iron Fingers That Make Words*, was treated by the natives as one of themselves, and in return he has done them the honor of not being sociological about them. Perhaps it is because he lived their life instead of merely observing it, and because he approached them with their own friendliness, that his book is rich in the comprehension which so

few white men feel for others not of their own color.

It is one thing to travel; it is another to recreate far places so perfectly that the reader has the illusion of having been there himself. Mr. O'Brien does this, and even more—he recreates the enchantment that travel has for those imprisoned against their will by the coil of circumstances. This book, written "for those who stay at home yet dream of foreign places," should be read by all those in whom the daily routine has not quite buried the dreams of the romance that lies over the world's rim.

MYSTERY AND MEDICINE.

The Pathway of Adventure. By ROSS TYRRELL. New York: Alfred A. Knopf, 1920. Pp. vii-310.

The individual reader borne breathlessly along this *Borzoi Mystery* highroad on coming to the end will say, "An unlikely story," half ashamed that he had really enjoyed the journey. But, should that man ever be in lazy chat with some dozen companions, he will find that nearly all can tell stories as strange and confirm the daily probability of the improbable. The beguilement of such books as those by Ross Tyrrell lies in the fact that they gratify the love of adventures which every man secretly longs for, and that hope of ultimate justice in that the hero always triumphs in the end over the forces of wrong arrayed against him. As in this story, four villains, armed with deadly weapons, are of no avail against the virtuous hero armed with a broken bladed penknife or a table leg. They may leave him wounded and gagged in a dank cellar or throw him out of a window or crack his skull, but he revives in a manner which should inspire every surgeon who figures in the *Annals of Surgery* with his "unique cases."

Such literature used to be advertised as "railway fiction" for travelers, but it is rather to be recommended in this day for reading in breezy, quiet holiday resorts, where the reader will have a chance of regaining a normal pulse rate after wild adventuring through its pages.

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

THE WHISPERING DEAD. By ALFRED GANACHILLY. New York: Alfred A. Knopf, 1920. Pp. xi-279.

THE HISTORY AND POWER OF MIND. By RICHARD INGALESE. New York: Dodd, Mead & Co., 1920. Pp. xxiv-329.

THE EARTHOMOTOR AND OTHER STORIES. By Dr. C. E. LINTON. Illustrated by MURRAY WADE. Salem, Oregon: Statesman Publishing Co. Pp. xiii-231.

THE REAL CAUSE OF STAMMERING AND ITS PERMANENT CURE. A Treatise on Psychoanalytical Lines. By ALFRED APPELT. Second Edition. London: Methuen & Co., Ltd. Pp. xi-234.

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Miscellany from Home and Foreign Journals

Coccygodynia.—Charles J. Drueck (*Western Medical Times*, March, 1920) says that coccygodynia is to be thought of in every patient with anal or sacral pain. In every rectal examination the coccyx should be carefully palpated and manipulated to determine any faulty position, undue sensitiveness, abnormal mobility or rigidity, or infiltration of tissue about the region. In mild cases nothing may be found but a tender spot on one or the other surface or at the tip of the coccyx. In other cases dislocation or fracture may be found, or a projecting bony spicule. In severe cases the patient may writhe or scream during the examination. A further examination of all the pelvic organs is necessary in order to exclude disease elsewhere, and sometimes this is impossible without an anesthetic. The prognosis in general is good. In many cases cure is spontaneous, though it may require months, so recent cases should be treated conservatively. Rest and hygiene are indicated until the acute symptoms subside; local medication and bandages are worthless. Sedative drugs and analgesics should not be used for fear of inducing a drug habit. The bowels should be kept open. A hot rectal douche at 105° F. for five minutes twice a day is sedative and relaxing to the tissues. External heat with the therapeutic lamp one hour night and morning is also of much value. Faradism, one pole over the coccyx and the other above the sacrum, or within the rectum, according to the location of the painful spots, is good. The injection of eighty per cent. alcohol into and about the sensory nerves often is satisfactory. The point of maximum tenderness is determined by digital examination. The index finger is retained within the rectum as a guide, a two inch needle is introduced through the skin in the posterior raphe, is carried to this sensitive area, and ten to twenty minims of eighty per cent alcohol is slowly injected. The injections may be repeated in five to seven days. They may be given without anesthesia, but most careful asepsis must be observed. If the suffering continues after a thorough trial of palliative treatment, excision of the coccyx is required.

Experiments on the Eye with Gas Mantles of Different Compositions.—C. E. Ferree and G. Rand (*American Journal of Ophthalmology*, January, 1920) reports experiments made with Welsbach mantles of known size and composition as to the effect of the light they furnish upon the loss of efficiency and discomfort caused by a certain amount of eye work done under such illumination. The conspicuous variables in these experiments were composition of light, a physical variable, and color value, a sensation variable, which are not synonymous and do not always go hand in hand. It is a natural inference that the results obtained were due to differences in the color value of the illuminants used, but it is conceivable that differences in composition of light may affect the power of the eye to sustain clear and comfortable seeing. They may affect the resolving power of the eye; they may exert an immediately deleterious or irritating action

on the delicate structures of the eye; they may have an effect on acuity through the color of the sensation aroused. If one were willing to draw conclusions with regard to composition and color value of light at this stage of the investigation, he would be inclined to say that in case of a given color the power of the eye to sustain clear and comfortable seeing decreases with the saturation of the color; but that independent of saturation some colors affect the eye more than others. A displacement from white toward a dominance of the short wave lengths of the spectrum affects the eye more than a similar displacement toward the long wave lengths. In considering the relative merits of illuminants the comparatively low surface brilliancy of the gas mantle should not be forgotten, it is of practical importance in the problem of providing adequate shading for the eye. In connection with the problem of shading the writers recommend that the 0.75 per cent. ceria mantle, and other mantles of low ceria content, be used with shade so selected that its color effect is corrective of the greenish coloration of the light given by these mantles. The amber shade should exert in some measure such a corrective action on the greenish light of the "standard" mantle.

Tartar Emetic in Ulcus Tropicum.—A. Mei (*Journal of Tropical Medicine and Hygiene*, February 2, 1920) states that tropical ulcer is very prevalent among the natives of Cyrenaica. In most of the cases seen, the *Spirochæta schaudinni* was found in the lesion. The known value of tartar emetic in various protozoal diseases led the author to try it in this affection, with marked success. Even when the drug is merely applied externally, the patient must be kept at perfect rest in bed. The copious secretion from the ulcer is removed with dry sterile gauze. The tartar emetic is applied only in small amount to the surface of the ulcer and beneath its margins, and the lesion then covered with sterile gauze and a light bandage. Applications are made at first twice and then once daily, according to the amount of secretion. The average duration of treatment is one month. Only occasionally, among children and European patients, is there intolerance to the remedy; iodoform is then substituted. Tartar emetic acts strongly on the spirochetes. After two or three days they are reduced to small numbers, in a degenerated condition, whereas the Vincent bacilli and various cocci are still present in large numbers. By the fifteenth day, all Vincent bacilli and spirochetes are gone, and only a few cocci remain. The ulcer improves coincidentally with the diminution and disappearance of the spirochetes, suggesting that these organisms constitute the true etiological agent in ulcus tropicum. In two native boys, intravenous injections of 0.06 grain of tartar emetic were given. Distinct but slow improvement followed, and later local treatment was substituted, with very good results. Treatment by intravenous injections of the remedy may prove useful in cases in which external application gives very severe pain, but is otherwise unnecessary.

Action of Curara on the Output of Epinephrine from the Adrenals.—G. N. Stewart and J. M. Rogoff (*Journal of Pharmacology and Experimental Therapeutics*, December, 1919). found in experiments on cats that curara in doses sufficient to paralyze the skeletal muscles markedly repressed the output of epinephrine from the adrenals. The depression begins promptly, and may be still well marked when the paralysis of the muscles has begun to wear off. No attempt was made to compare exactly the doses of curara required to paralyze the epinephrine secretory fibres and the cardioinhibitory fibres, but a marked diminution in the epinephrine output was observed in samples of blood collected from the adrenals at a time when stimulation of the vagus caused inhibition of the heart. In general, curara should not be employed in experiments on the epinephrine output.

Mitral Stenosis in Soldiers.—T. F. Cotton (*British Medical Journal*, December 27, 1919) reports observations on seventy-five patients with signs of mitral stenosis, and analyzes the histories of fifty of these. Tests with the exercise tolerance of the patients led the writer to conclude that the increase in pulse rate is a useful sign in estimating the exercise tolerance, but it is not of value in distinguishing between early and developed mitral stenosis. The average early mitral stenosis showed better exercise tolerance than the disordered action of the heart, but when the distress after exercise was as great in stenosis as in D. A. H. the pulse rate rose as high after exercise in the one as in the other. It is pointed out that the symptoms of cardiac failure may be observed in patients with no signs of structural disease of the heart and in particular in cases of D. A. H. The suggestion is made that the same cause produces the symptoms in early mitral disease as in D. A. H. Prognosis is discussed and emphasis is placed on the importance of any considerable enlargement as an unfavorable sign.

Pupillary Symptoms in Embolus of the Central Artery of the Retina.—John Dunn (*Archives of Ophthalmology*, March, 1920) reports a case of embolus of the central artery which is of peculiar interest because the direct reflex response of the pupil to light was absent as long as the edema of the retina persisted, but returned after the edema had disappeared. Dunn has maintained for several years that the direct response of the pupil to light is an extracerebral reflex and that its nervous pathways are from the retinal cells to the retinal pigment cells, along this pigment layer to the ciliary region, where sensory impulses are aroused in the sensory nerves to the ciliary ganglion from this region, thence along these ciliary sensory nerves to the ciliary ganglion, in the substance of which impulses are aroused in the motor cells of the ganglion, which impulses passing outward result in contraction of the pupil. Thus he explains the phenomena of the Argyll-Robertson pupil, the behavior of the pupil in the second stage of anesthesia, the pupillary phenomena that precede death, and he believes this case to be confirmatory of his theory. Another interesting point was the preservation of a tongue-like projection of normally pink retina from the outer margin of the disc nearly to the cherry spot.

The Relation of Dust to the Spread of Tuberculosis.—H. C. Sweany and C. C. MacLane (*Illinois Medical Journal*, December, 1919) report that of 134 samples of dust taken from rooms where open cases of tuberculosis were being treated, twelve were positive. Of eighteen samples taken from the Cook County jail, three were positive. Seven positive cases were found in single and double rooms facing north, while only two were found in rooms facing south. The greatest percentage of positive samples was found in places where the greatest number of open cases were being treated. A suspension of tubercle bacilli in salt solution was killed in twenty minutes in direct sunlight with the sun's rays at an angle of fifty degrees; five hours in a film of dust in direct sunlight, five days in a south room, and seven days in a north room.

Letters to the Editors.

VENEREAL DISEASE PERIL.

NEW YORK, July 22, 1920.

To the Editors:

In your issue of April 3rd last, it was stated by an Australian that the ratio of venereal infection among the British forces was never so high as in their army of occupation during the early part of 1919. In an editorial in your issue of June 12th last it was also stated that the increase had been much greater in Europe than in the United States, and that the augmentation in cases of venereal infection in Canada had been "almost incredible," in fact, that the venereal problem was the "outstanding problem of the day." We have also been told by Dr. Joseph E. Moore, one of our military men on duty in Paris (*Journal of the American Medical Association*, April 24, 1920), that at one time he found the incidence of infection there, among our men, four times that of any other locality in the zone of warfare. As many as 70,000 prostitutes plied their trade actively in that city, and almost unmolested by the police.

Morel, also in the *Daily Herald* (London) in its issue of April 10th, tells of practices by the colored troops which were even more shocking. While thirty to forty thousand of them were occupying the enemy country, girls and women were raped and there was such wholesale infection that the hospitals were filled to overflowing with their victims. The details which he has given of practices controlled by the military authorities, in the zone of occupation, I will not give. Perhaps they still prevail there.

As these amazing statements have, so far as I know, not been contradicted, is it not our duty, as civilized beings, to have them verified or disproved?

If we as Americans are, as it seems, face to face with a real venereal peril, should we not recognize at once the menace of such European conditions, to ward them off as far as we can, and fix the responsibility for them, even if it should be shown that our sanitary authorities abroad were lax in their duties. Otherwise this subject would properly merit a congressional inquiry.

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Original Communications

THE BORDELAISE CONCEPTION OF ENCEPHALITIS LETHARGICA.

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I recall that from September to the end of December, 1915, first at Commercy, then at Verdun from December to the middle of February, 1916, and finally at Bar-le-duc, and at various successive medical military centres, where I had charge of important neuropsychiatric services, I noticed that the type of encephalomyelitis which we observed was different from the forms we had habitually encountered. In April, 1917, and prior to von Economo and Netter, we isolated with Montier and Calmette forty of these cases. These observations were published under the name of subacute encephalomyelitis (1) and the disease described was identical with the syndrome described since that time under the name of encephalitis lethargica. The following is the exact text:

Formerly it was fairly easy to diagnose the ordinary lesions of the order of cerebral, protuberential, cerebellar, bulbar, medullary, but the hypothesis of hemorrhage or softening, of tumor, diabetes or uremia, of tuberculosis or syphilis, were successively discarded. There were the central lesions, called polioencephalitis, studied by Medin and American workers, which clearly had the character of an epidemic with the characteristic abrupt inception, an elevated temperature, vomiting, marked pain, and an extensive dissemination of the paralytic disturbances, which eventually limited themselves to certain muscle groups, followed by more or less atrophy.

In various cases the febrile reaction was not intense. At times it would seem that we were confronted with a more or less attenuated form of typhoid or paratyphoid fever, but the examination of the blood did not corroborate this. The hypothesis of a fruste form of cerebrospinal meningitis did not lead to a more clear diagnosis, for the examination of the cephalorachidian fluid, even if it frequently gave a lymphocytic or albuminose reaction did not reveal anything in the way of microbes.

Whereas it was impossible not to be impressed by a certain similarity between the various cases, one was tempted to classify this disease with the attenuated affections of the central nervous system.

The general clinical characters of the disease were as follows.

ONSET.

At the onset the subjects manifest an extreme lassitude, a physical and mental asthenia; in place of a violent headache they complain of a feeling of heaviness. The fever, which occurs infrequently, is at times manifested by a feeble elevation of temperature, between 37.5° and 38° C., for a few days. In some cases the elevation is more marked, and this is interpreted as an accident in the evolution of the clinical signs, ictus, convulsions, or bulbar asphyxia. The age of the patients varies between twenty-five and forty-five years. Their inert facies, emotional indifference, semicomatose state, loss of weight, earthy appearance, at times subicteric, their lack of appetite, give the patients the appearance of being profoundly infected or toxic.

CLINICAL FORMS.

In a general way there are a complete series of clinical forms which are as follows:

1. A mental form, in which the cerebral torpor, the amnesia, the disorientation, the pupillary manifestations, the tremor, the dysarthria, even the paraphasia and the reaction of the cephalorachidian liquid, give the impression of a general paralysis of one type or another.

2. A convulsive form, in which the crises create a veritable convulsion, which generally subsides.

3. A chronic form, with all the characters of the adult form of an infectious chorea.

4. A meningitic form, in which the meningeal reactions (stiffness, Kernig, rachialgia, somnolence and vasomotor phenomena) are always associated with profound and tenacious encephalitic disturbances, which are not explained by any of the known agents.

5. A hemiplegic form, or rather hemiparetic, which, by its rapid regression and stabilization at a certain stage of its evolution, is clearly differentiated from the ordinary hemiplegia of the adult.

6. A pontocerebellar form, with ptosis, paralysis of accommodation, titubation, and a simple cerebellar form, recall the symptomatology of tumors of the cerebellum.

7. A bulboprotuberential form with various nuclear lesions of the nerves of this region, trigeminal, facial, vagospinal.

8. A mild ataxic form, which in certain ways recalls the polyneuritis of toxic infections.

9. An anterior poliomyelitis form, in which the initial characters, at least, make one think of infantile paralysis. This is an exceptional form.

EVOLUTION.

In their evolution these clinical types, which are frequently associated with one another in their development, go side by side in spite of their polymorphisms. Aside from two cases of sudden death (one during a convulsive seizure and the other by bulbar asphyxia) the regression in these subjects was slow, and the subjects, asthenic and somnolent, progressively regained their health. The sequelæ drag along and manifest themselves in relation to their anatomical lesions, paralysis or spasmodic states, cerebral fatigue, muscular atrophy, and other manifestations.

Plating of cultures and inoculation of the blood of the guineapig, as well as the examination of the cephalorachidian fluid, was systematically practised with no results. From the patient who died suddenly from bulbar asphyxia, a quantity of the material nearest the bulb was mixed with one c. c. of physiological serum and injected into the brain of a rabbit without any result. We were badly situated to conduct any pathogenic researches, for most of the patients on their arrival were entering into the period of stabilization of their disease, and when the infection was in the state of recession. The disease which was not well known would frequently be entirely overlooked, and often the symptoms would be attributed to the exaggeration of a constant fatigue.

Therefore in our first communications, we insisted upon the polymorphism of this disease which recalled in many ways Medin's disease, but was differentiated at the same time by the infrequency of the medullary localizations and the frequency of the attenuated encephalitis, the irregularity of the temperature, which was usually moderate, the ordinary absence of pain, and the persistence of the cerebral torpor. We have emphasized the inert facies of the patients, their asthenia, their somnolence, which always indicated a slow convalescence.

At the end of 1917 (1) we again called attention to this little known disease which nevertheless continued to pass unrecognized in France until the communication of M. Netter in March, 1918, upon encephalitis lethargica.

We have never ceased to consider this name as being inexact. We have shown by the foreign documents, notably English, that the trilogy of symptoms cited by Netter—lethargy, fever, and ocular paralysis—could not be applied in all cases. We have always contended that encephalitis lethargica was a particular form of diffuse encephalomyelitis, which we isolated in April, 1917 (1).

Our understanding or idea of encephalitis approved of at Bordeaux not long before, in all other respects appeared to be in accordance with the scope of a number of communications on encephalitis lethargica which have appeared in France since the end of 1919; at Lyon, Montpellier, Nancy, Angers and notably at Paris, where MM. Chauffard, Pierre Marie, Achard, Widal, Sicard, and others specifically agreed on all points we demonstrated

(clinical anatomicopathological, nosographical) and our interpretation.

Concerning the details of certain clinical forms, such as the myoclonic of the type of electric chorea of Dubini, the ideas set forth by M. Sicard tend to reinforce the original ideas we had some time ago. In 1907, I insisted upon the rhythmic character of the chorea of Dubini, and definitely separated the movements, classifying them under the name of rhythmic rather than the more vague term of myoclonia.

These marked rhythms, as we indicated in the beginning, are always symptomatic of serious cerebrospinal lesions; especially in tuberculous meningitis, and in the complications of central localization in typhoid fever, alcoholism, measles, bronchopneumonia, and other infectious diseases. One of their essential characters is their persistence in sleep or coma, contrary to those occurring in true chorea. The prognosis is invariably fatal (1).

These particular manifestations are encountered in rhythmic encephalitis and actual myoclonias, as have been described in a number of cases seen in Bordeaux, Lyon and Paris.

CONCLUSIONS.

1. Encephalitis, called lethargica in May, 1917, at Vienna and in March, 1918, at Paris, was considered and described on the 27th of April, 1917, as one of the forms of subacute or diffuse encephalomyelitis.

2. The Bordelaise concept of encephalitis lethargica, or better called epidemic encephalomyelitis or the disease of Cruchet (as it is called in the Girondine region) is that which is adopted in England, in the United States, in Italy, Spain and in the South American countries, and is also accepted in France in the large centres like Lyon, Nancy, and Bordeaux, and was finally accepted in Paris.

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Early Diagnosis of General Paralysis of the Insane.—Egbert W. Fell (*Southern Medical Journal*, March, 1920) says that a change in disposition or habits in a middle aged man should always cause suspicion of paresis. A diagnosis of paresis is possible even in the early stage by a careful consideration of the mental, neurological, and serological findings.

THE SYMPTOMS OF EPIDEMIC ENCEPHALITIS STRUCTURALLY AND FUNCTIONALLY CONSIDERED.*

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Most of the reports which have appeared on the subject of epidemic encephalitis have been limited mainly to a description of the symptomatology and pathology of the disease. The epidemic furnished extremely rich and varied material for accurate observation, and clinicians have been afforded ample opportunity for the exhibition of their diagnostic acumen. Indeed, the multiplicity of symptoms which have been recorded and the new clinical entities which have been described almost make one feel as if the clinical side has been just a bit overemphasized, while other lessons have not been sufficiently pointed out. Without in the least trying to minimize the value of the clinical and pathological studies, and they are perhaps most valuable from an immediately practical viewpoint, an attempt might be made to interpret the clinical signs and symptoms in the light of anatomy and physiology and to inquire whether any new lessons may be drawn as to the structure and function of the nervous system.

The disease has afforded one of the rarest opportunities for the study of the functions of the nervous system and possibly may throw some light on the more obscure causes of chronic degenerative diseases of the nervous system, such as paralysis agitans, multiple sclerosis and others. Some symptoms, too, such as chorea, myoclonic movements, lethargy, cataplexia or the Argyll-Robertson pupillary phenomenon and symptoms referring to the extrapyramidal system, will bear further consideration in the light of our experience with the epidemic.

Our knowledge of the structure and function of the brain is based on the study of its anatomy and embryology (ontogenesis, myelinization), on comparative anatomy, on congenital anomalies, on methods of degeneration, on direct physiological experimentation such as electrical stimulation and on the correlation of clinical signs and symptoms with structural changes caused by disease. A number of names occur as one scans the list of great anatomists, neurologists and physiologists who have contributed to our knowledge: Gall, Flourens, Bocca, Hammarberg, Goltz, Elliott Smith, Bevan Lewis, Campbell, Bolton, Hitzig, Flechsig, Brodman, Meynert, Bechterew, Wernicke, Sherrington, Cajal, Dejerine, Head, and others.

The works of these men have helped us to understand the structure and function of the brain and aided us in the intelligent interpretation of clinical findings. Neurology, more than any other branch of medicine, lends itself particularly well to study of disease in terms of anatomy and physiology pathologically affected. Instead, therefore, of merely enumerating symptoms as parts of a picture it might be wiser wherever possible to focus one's attention on the structure and function of an affected part and

correlate with that the resulting symptoms. For instance, instead of enumerating a dozen different forms of tabetic crises, we may explain them by the underlying pathology, and merely state that involvement of the lowest sacral roots will cause vesical and rectal crises, of the lumbosacral roots lancinating pains in the legs, of the vagus gastric symptoms and so on with the girdle pains, laryngeal crises, renal crises, lachrymal crises, etc. From the practical viewpoint the important thing with reference to epidemic encephalitis is to determine the etiological factor and to make sure that we are dealing with one clinical entity. The work of Strauss and Loewe bids fair to establish the former and the whole course of epidemic has given conviction on the latter.

It has been shown that the disease is a meningo-myeloencephalitis with the last greatly predominating. Whether the peripheral nerves have been at all affected is difficult to say, as no definite pathological reports have been recorded, and whatever peripheral palsies have been observed can more readily be explained by nuclear or central involvement. If, however, one accepts the cases reported as acute infectious polyneuritis and infective neuronitis the peripheral nervous system may be said to have been involved. In some cases there have been undoubted involvement of the anterior horn cells of the cord resulting in paralyses such as are seen in poliomyelitis. The involvement of the roots of the nerves, probably in a localized meningitic process, explains the frequent onset of the disease with a sciatica, a pleurisy, a trifacial neuralgia, and some recognized but at first uninterpreted radiculitis. The hemiplegias, diplegias, facial paralyses, ptoses, strabismus, are easily explained by lesions involving the pyramidal tracts, the nuclei of the seventh, third, fourth or sixth nerves. Involvement of the phrenic nerve which has been clinically observed was no doubt due to a lesion in the cervical cord, but most of the respiratory symptoms were secondary to lesions in the bulbar centres.

However, there are other symptoms and signs which stand in need of explanation. The Argyll-Robertson pupil has been encountered occasionally, although paralysis of accommodation alone and no loss of pupillary reaction to light was much the more frequent. Now, an A-R pupil is a sign of neurosyphilis, more particularly the tabetic or parietic type, and yet it was undoubtedly seen in epidemic encephalitis. We have, therefore, an acute Argyll-Robertson coming on in an acute disease, persisting for a while then disappearing. The pathology of the phenomenon is not as yet known, but we may infer that a minute hemorrhage or inflammatory focus in the midbrain, either in the nucleus of the third nerve or the Edinger-Westphal nucleus, or superior quadrigeminal or the connections between them is responsible for the phenomenon. Marina's suggestion that the lesion of an A-R pupil is in the ciliary ganglion seems to be made untenable. The cases reported early in the epidemic as exhaustion pseudoparesis may possibly have been of epidemic form and point to difficulty originally encountered in properly interpreting the Argyll-Robertson phenomenon. Paralysis of accommodation which occurred

*Observations based on material in the service of Dr. B. Sachs at the Mt. Sinai Hospital.

so frequently, at times as the only symptom and more commonly as the only persisting symptom, must be attributed to injury of the so-called accommodation nucleus which lies farthest forward at the tip of the third nerve nucleus in the floor of the aqueduct of Sylvius. It is not likely to be due to involvement of individual fibres, although it is known that paralysis of accommodation occurs in acute infections, for instance in diphtheria, in which peripheral neuritides are not uncommon.

A curious phenomenon which has been observed in the course of the epidemic was the localized mass movements of groups of muscles, particularly of the abdomen, by some grouped under chorea and by others as special myoclonic movements. Indeed, the attempt has been made to make of the symptoms a distinct clinical entity or at least to endow it with special significance. As commonly interpreted the symptom was said to be due to involvement of the lower motor neurons, that is the lower motor cells supplying the muscles. This seems unlikely, as the most common symptom attributable to an irritative lesion of that sort is fibrillation. This is a slow, vermicular movement of parts of a muscle and not the complete movement of a whole muscle or group of muscles. The irritative phenomenon must therefore be explained by a lesion higher up. It is probable that minute hemorrhagic or inflammatory foci in the higher motor cells were responsible for the myoclonic movements.

Peculiar champing movements of the jaws have been observed and they too have been included under the myoclonic movements. These can perhaps be explained by lesions in the midbrain. Experimental studies in Bechterew's laboratory, particularly by Jürman, and studies on degeneration, etc., go to prove that the substantia nigra governs the functions of chewing and swallowing. Indeed, direct stimulation of the substantia nigra *Soemmeringii* caused just such movements as were observed during the epidemic. The substantia nigra was also shown to have connections with the caudate and lenticular nuclei and opercular cortex. In view of the affinity of the encephalitic virus for the midbrain and basal ganglia and in view of the presumed function of the substantia nigra and of its connections it may not be too farfetched to attribute the champing movements to an irritative lesion in it.

With reference to the tremors, choreic and athetoid movements, we stand on somewhat firmer anatomical and physiological ground. The tegmentum of the midbrain evidently is the concentrated associational centre for these nonvolitional movements. The red nucleus of Monakow connects with the cerebellum by way of the superior peduncle; it sends fibres down to the cord by way of the rubrospinal tract, and also connects with structures higher up, particularly with the striate body. A thalamic lesion, also, may give rise to choreoathetoid movements. A lesion, therefore, in any one of these structures may be followed by tremors, choreic and athetoid movements. This is all the more likely in view of the well known cerebellar or ataxic component of choreic movements. It is difficult of course to dissociate the cerebellar component of speech, but the musculature

involved stands in associational relation with the cerebellum and a lesion in some of the pathways will account for the disturbances of speech, particularly the slow and scanning variety. Acute chorea frequently illustrates the cerebellar disturbance to a marked degree. The lesion here as well as in cases showing pure ataxia need not be in the cerebellum, but may well be in any of the numerous pathways. The absence of reports on cerebellar foci would tend to confirm this view.

The whole striatal or extrapyramidal system has been held to account for the tremors, rigidity and catatonic symptoms. (With reference to the last more will be said later.) The acute paralysis agitans, the general rigidity, the loss of associated movements, the tremors, etc., have hitherto been attributed to lesions in the extrapyramidal system. Strümpell tried to correlate Wilson's disease, pseudosclerosis of Westphal and paralysis agitans and described what he calls an amyostatic symptom complex on the basis of disturbance of that system. He stresses the disturbance of posture and of the associational activity not directly involved in motion; this has also been emphasized by other workers, particularly Ramsay Hunt. Many cases, however, of acute epidemic encephalitis exhibited apparent loss of associational movements but showed neither the rigidity nor the tremors, so that other factors, more likely thalamic, must be taken into account. The great importance of the acute paralysis agitans and the involvement of the extrapyramidal system lies in the light it throws upon the possible genesis of chronic Parkinson's disease. The disease may be inflammatory at the start and later on degenerative. The complete or partial recoveries which have been observed and the progressive conditions also throw light on the pathogenesis. Parenthetically it may be added that some patients showed simultaneous involvement of the pyramidal and extrapyramidal systems, as evidenced by a Babinski, absent abdominal reflexes, and a typical paralysis agitans syndrome.

The facial expression, or rather loss of facial expression, has been attributed to striatal involvement. This seems to the writer to be too sweeping a generalization. Omitting the pseudobulbar type, there are three different kinds of facial expression. First, there is the actual Parkinsonian facies with rigidity which becomes masklike. There is no loss of motor power, but the movements are slow, dissociated, and involve only that muscle or group of muscles which are absolutely necessary for the execution of a circumscribed movement. Other associational activity, such as movements of the eyes in smiling and speaking or that of the forehead muscles in opening the eyes, and other similar movements are altogether wanting. Secondly, there is complete bilateral paralysis, probably nuclear in origin, of the facial nerves. It is not a question of associational loss, but of absolute paralysis. Not a muscle can be moved, the wrinkles, curves and lines disappear, the face is flattened, ironed out. The want of expression is not due to inherent absence of expression but to the inability to lend motor power to its execution. Thirdly, and what seems to the writer to be more significant of epidemic encephalitis, is the listless, dull, expres-

sionless, not quite waxlike face which simulates double facial paralysis. There is no rigidity as in Parkinson's disease and no paralysis as in the double facial form. The patient can move all the muscles and even associated motor activity is present, but there is no emotional life behind it, no intellectual background. It is, if you will, a face without a soul.

The last type of facial expression probably betrayed an involvement of the thalamus. The affective life seemed to have ebbed out. Head has insisted upon the affective, emotional aspect of the optic thalamus, and it is quite possible epidemic encephalitis attacked that side of it without hitting the special sensory end stations. But in the facial expression it would seem as if the conative side of thought has been hardest hit. Intellectual activity seeks expression in motor activity; this is most marked in the face and there any interference is most easily detected. Other motor activities such as gestures and postures also form part of the conative tendency; a general inhibition of all of them was noted in epidemic encephalitis. There seems to have been a dissociation between thought, emotion and motor activity and a considerable slowing down of each. The thalamic, affective disturbance in epidemic encephalitis often dominated the whole clinical picture or furnished the background against which were silhouetted motor, sensory and psychic disturbances.

Other syndromes were observed from time to time and they are equally interesting although their explanation is less speculative. Unilateral tremor and paralysis of the oculomotor, the so-called Benedict syndrome, owed its existence to a lesion in the tegmentum which involved the red nucleus and the third nerve nucleus or its fibres which traverse the nucleus ruber. A true Weber's syndrome paralysis of the oculomotor causing ptosis, external strabismus, fixed, dilated pupil, etc., on the same side of the lesion, and hemiplegia on the other side—was occasionally encountered. This of course was due to a lesion in the crus which compromised the corticospinal fibres and its traversing oculomotor nerve.

In a few instances one noticed conjugate deviation of the eyes. It is fair to assume that the lesion was most frequently in the midbrain and pons although there are numerous locations in the brain which might account for conjugate deviation, and in view of the numerous inflammatory or hemorrhagic foci which were found scattered in pathological sections such an assumption is not out of place. In the second frontal convolution there is one centre which if affected may give uncomplicated deviation of the eyes to one side. The same result may follow upon lesions at the knee of the internal capsule, but pyramidal tract signs would be associated with the ocular symptoms. Some authors maintain that there is a centre for conjugate deviation in the parietal lobe and a few clinicians have diagnosed lesions, such as tumor and abscess, in virtue of that symptom. This, however, is still a matter of dispute. A fourth place causing paralysis of gaze is in the hypothalamic region involving the fibres to the oculomotor, but here we get a vertical paralysis. Involvement of the pes lemniscus superficialis and profundus also gives

paralysis of gaze. A lesion in the sixth nerve nucleus which controls not only the external rectus of one side but the internal rectus of the other results in paralysis of lateral gaze. This form of conjugate deviation is frequently called the syndrome of Foville. Finally, lesions in the posterior longitudinal bundle and the Deitero (vestibular) oculomotor pathways will also give conjugate deviation. In each instance, however, the presence or absence of other symptoms helps to determine the site of the lesion. For instance, nystagmus and ataxia accompany lesions in the vestibular pathways, a facial paralysis in the case of the posterior longitudinal fasciculus and so on with the others.

Attempts have been made to explain the bladder disturbances, particularly retention, by means of lesions in the midbrain. There is some ground for believing that there is a centre there which controls the bladder function, but more definite observations are required to establish the fact beyond peradventure. The same may be said of some disturbances of function of the sympathetic system, such as vasomotor changes, sweating, etc., which have been observed. Certainly the midbrain and bulb and very likely the cortex stand in intimate connection with the general sympathetic and autonomic systems. In the case of urinary retention it is quite possible that the brain, because of the general affection, is unable properly to receive and interpret afferent sensory stimuli or send out efferent motor impulses.

The question of catatonia, catalepsy or *flexibilitas cerea*, has been variously interpreted. It is doubtful whether one can altogether explain it, as has been attempted, by involvement of the extrapyramidal system. There is not that mimic and other rigidity which one is accustomed to see. One might invoke the cerebellar mechanism (particularly in view of the asthenia, which could be so interpreted) but that, too, does not give the desired explanation. More likely is it that we are dealing with a true cerebral condition, or rather interference with cerebral function and the consequent liberation of uncontrolled, unconscious activity. Theoretically, dissociative hypnotic catalepsy furnishes a parallel. But there are some pathological facts which may explain the catatonia. Southard has demonstrated lesions in the supracortex or neopallium in the parietal regions of brains of patients who suffered from catatonic dementia præcox. Whether minute lesions or general toxic affection, edema, etc., can explain the catatonic conditions in encephalitis cannot be definitely stated, as Southard's work has not been altogether confirmed; but inferentially one may speak of the cortex as the probable seat of the lesion in catatonia. It should be recalled that Alzheimer speaks of a gliosis in the lower layers of the cortex in catatonia.

The coma in epidemic encephalitis has given rise to a good deal of discussion. The fact is that it differs from the comas with which one is familiar. Indeed, it may be doubted whether the patients are either sleepy or comatose. What strikes one most forcibly is a want of attention even after momentary well coordinated responses to stimuli, an indifference, an utter absence of emotional response. There seems to be a paralysis of the emotions. There is

general apathy, a seeming indifference to general sensory stimuli. Even at the risk of riding the thalamic hobby horse too hard one might invoke the aid of a disturbance in affective control of the thalamus as an explanation for the puzzling condition. Certainly the corticothalamic connections are affected. In very severe cases, the patient is a vegetating automaton without either intellectual or emotional life, barely showing a human flicker and not betraying the slightest sign of struggle, physically or psychically.

Some have attributed somnolence to disturbance of the pituitary; others referred it to the pineal gland. All these suggestions are interesting but have little to recommend them. Nobody has observed actual signs or symptoms of involvement of either of the hypophysis or epiphysis cerebri. It may be urged that the functions of the brain, more particularly the higher function, are not limited to any particular part and that a general disturbance accounts for the alteration in the psychic and emotional life of a person suffering from epidemic encephalitis. Perhaps disturbance in the neuroglia may account for some of the general symptoms. Achucarro's view that the neuroglia is a structure or organ of internal secretion may satisfy those who are speculatively inclined, although few pathological changes have been reported in the glia structure of brains which have been studied closely.

The term manic has been frequently employed to describe the mental condition of patients with encephalitis. In most instances the term was very unfortunate. What the patient suffered from was delirium—an infectious or toxic delirium such as is seen in other diseases. They did not have a true psychosis despite the fact that they seemed to have delusions or hallucinations. To be maniacal in a delirium does not mean that the patient has a psychosis. It is only when mental symptoms persist after the acute febrile condition has subsided that one may speak of a psychosis as the result of epidemic encephalitis. Such cases have occurred, it is true, but they have been extremely rare. The same thing may be said of convulsions in the course of the disease. The common term epilepsy is not strictly applicable.

The whole course of the disease proves that it is a general infection with selective affinity for the central nervous system. The fever is in favor of such a conception. The fact that most of the pathological changes are mesodermal—meningeal inflammation, perivascular infiltration, small hemorrhages, occasional thrombosis with secondary necrosis, edema, etc.—also points in that direction. Finally the successful reproduction of the disease in animals by intravenous inoculation (Strauss and Loewe) furnishes very strong evidence. The morbid changes resemble those found in other infectious diseases of the nervous system. The similarity in the pathology of many diseases of the nervous system of different etiology suggests that it is the underlying histological structure of the cerebrospinal axis which mostly determines the reaction and not the individual causative factor. The histopathological picture seems to depend more upon the question of whether the mesodermal or ectodermal structure is mainly involved.

1291 MADISON AVENUE.

ENCEPHALITIS LETHARGICA.*

A Study of Its Clinical Aspects.

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In the early part of 1917, Von Economo and Von Wiesner (1), of Vienna, reported a disease affecting the central nervous system, of which lethargy was the most prominent symptom. Von Economo thereupon coined the syndrome, encephalitis lethargica. This name is incorrect and has other shortcomings, but for the present at least the disease will have to be so called. It has been found, however, that eighty per cent. of the cases have shown lethargy.

That this is not an entirely new disease is shown by Crookshank (2), who pointed out that epidemics of disease resembling encephalitis lethargica occurred at various times and under different names in medical literature, going back at least 450 years. It seems that whenever it appeared, it was always thought to be a new disease. Linnæus called it raphania, and thought it was due to radish seeds; the Germans thought it was due to contaminated meats, such as sausages. Albrecht, in 1695, described it as the lethargica fever with disseminated eye signs. In the sixteenth century it was seen in Italy, and called *mal mazuze*, or sickness of sleep. In 1890 epidemic encephalitis swept over the Lombardy Plains of Italy, and even Hungary, where it was called nona. In 1917 it was called the mysterious disease, in Australia.

The relationship of epidemic encephalitis to influenza has been pointed out by Jelliffe (3), Menninger, and others. It has been linked with botulism and atypical poliomyelitis in the early days. Bassoe (4) thought the histology bore some resemblance to the trypanosome infection. However, it is a disease entity, with its own peculiar pathology and bacteriology.

Next to the protean clinical symptomatology displayed as a result of the syphilitic virus involving the central nervous system, in the variety of clinical symptoms engendered in this disease it easily ranks second. Because of this fact for the present at least, each writer establishes his own classification as a working hypothesis, in recording his cases.

AGE AND SEX.

A case of congenital epidemic encephalitis was reported by Harris (5). The mother, aged twenty-eight, was a victim of this disease, and gave birth to a child that seemed excessively drowsy. On the third day, a lethargic condition set in. This lasted for several days with subsequent recovery. The youngest patient recorded as having this malady was four months old, the oldest was aged ninety-six years. The greatest number of cases are found in those who seem robust and healthy. Its most frequent occurrence is between the ages of twenty and thirty, which bears this out. Males are more often affected than females.

*Read before the Bronx County Medical Society, May 19, 1920.

GENERAL SYMPTOMS.

Lethargic encephalitis is an acute disease affecting the central nervous system. Like all acute infectious diseases, it may appear as a fulminating type and the patient dies within a few days, or, as in the majority, as a long drawn out illness.

The general symptoms begin with the patients being either apathetic and drowsy or showing an initial exhilaration. They may continue to be drowsy and walk about in this way. In two cases of this variety the patients walked into the Lebanon hospital clinic, showing acute Parkinsonian symptoms, i. e., in their gait and attitude, and they had tremor, rigidity, and rise in temperature. One of the patients in addition showed an involvement of the right sixth nerve. This condition may then become stationary, or take the form of pathological sleep and lethargy. The exhilarating type shows an excessive energy at work or at play, which may later merge into the drowsy or sleeping state. Dr. Richman, who had epidemic encephalitis in 1918, showed periodical states; either he was asleep or very restless. He showed the most marked restlessness that I have ever seen. He kept turning continuously in bed pleading for opiates. Headaches are severe in some cases; vomiting and giddiness in others. Many patients complain of neuralgic pains, and pain in back of the neck, together with suboccipital tenderness. In these cases Kernig's sign could often be elicited. Coarse tremors were often found in the fingers early in the infection. A severe chorea would at times usher in the disease. The temperature would rarely rise above 101° F. Someone has characterized this infection as a low smoldering fire. The terminal states were often marked by higher temperature, which was frequently a complication and not a picture of the disease proper. A good many patients died from hypostatic pneumonia.

LOCAL SYMPTOMS.

The local symptoms are dependent upon the area involved. The disease seems to have a predilection for the mesencephalon, and the basal ganglia. This fact accounts for the frequency of third nerve involvement, with ophthalmoplegias resulting in early diplopia; the red nucleus, and superior peduncular fibres, showing the chorea, athetoid movements often remaining as residual symptoms; the tremors, Parkinsonian rigidities, a picture of corpora striata invasion, particularly of the pallidal system, which controls the automatic and associated movements; and finally the cutting off of all centripetal stimuli to the thalamus, resulting in sleep. Climenko (6) tries to explain this phenomenon on the basis of a toxic involvement of the pituitary which leads to a temporary suspension of function, similar to hibernation, which was first noted by Cushing. If the neighboring internal capsule is affected with involvement of the corticospinal tracts, we have hemiplegia and other similar manifestations. Again the pontine and medullary nuclear implications give rise to their respective symptoms.

The toxic involvement of the endocrines, autonomic, sympathetic systems is striking adrenals being particularly affected and showing the severe constitutional toxemia. Hypoadrenia with exhibition

of Sergent's white line has been noted by Climenko (6), Goldmark, and myself. I have witnessed its disappearance in a patient with marked asthenia after the administration by mouth of whole adrenal gland. In the service of Dr. Goldmark at the Lebanon Hospital, hypodermic injections of adrenalin led to an improvement in blood pressure, pulse, and the disappearance of Sergent's white line. Alexander and Allen (7) observe strange vasomotor phenomena. A child, aged five and a half years, who had epidemic encephalitis, showed half of the ear flushed, while the remaining half was blanched white, also flushing of only one cheek at a time and a sudden cyanosis of one hand, while the radial pulse was equal on both sides.

PSYCHIC TYPE.

CASE I.—I was asked by Dr. Gitlow to see a male patient, aged forty-five. For three weeks his temperature never exceeded 101° F. No pathological changes were found in the viscera. Neurologically he showed a marked suboccipital tenderness, a slight facial droop on the right side, and a right Babinski that was not constant. Psychically his memory and retention were poor. He showed an incomplete Korsakoff syndrome. In addition he had delusions of persecution, of a sexual accusatory character. I performed a lumbar puncture, and the fluid came out under very high pressure. The fluid was clear. The Wassermann was negative. The patient recovered completely in a few weeks.

There are now two girls at the neurological clinic of Mt. Sinai Hospital, one aged twenty and the other twenty-one. Both gave a history of having had colds, accompanied by fever, extreme restlessness, and insomnia. Both show a psychosis of the manic depressive type, one belonging to the cyclothymics with alternating periods of depression and excitement. Both patients showed a suppression of their menstruation, one not having menstruated for five months and the other for three. Neurologically they showed negative findings.

Here we have cases of a toxic psychosis, which gave rise to hallucinations, delusions, catatonic states with *flexibilitas cerea*, reminding one of the catalepsies in dementia *præcox*. Kinnier Wilson reported a patient who showed a typical *witzelsucht* (8), Climenko's (6) case showed a true Korsakoff syndrome. It must be observed, however, that as a general rule, even at the height of the disease, during pathological sleep, the memory is surprisingly accurate, and the mental attitude one of absolute indifference. The facies depict no emotional play, due perhaps in some cases to facial nuclear, supranuclear or nerve involvement, and in others to striatal tract implication as in Parkinson's disease, with its rigid masked features.

CEREBRO CEREBELLAR TYPE.

Alexander and Allen, who have collected the data up to date, state that the oldest patient who contracted this disease was aged sixty-two.

CASE I.—This female patient was sixty-five years of age. The history shows that four grown up children had so-called influenza. They recovered, when the mother, who was nursing them, contracted the disease. She had pneumonia, was cared for

by Dr. Handleman, and was up for a week, when she became listless and drowsy. When I saw her she was in bed, the face was masked, the eyelids were closed; she would raise them half way when requested. When she was requested to do this a number of times in succession, this effort would be followed by an inability to open the lids, reminding one of the observation made by Hall (9) and Foster Kennedy (10), that the condition resembled myasthenia. The pupils reacted to light. I could not elicit any other test that required the patient's cooperation. Her pharyngeal and uvular reflexes were absent. The neck and both upper extremities were rigid. The radial and triceps reflexes were obtainable. The lower extremity on the right side was drawn up and rigid. The knee jerk on this side could not be obtained because of an anomalous condition of the quadriceps tendon on that side. The left knee jerk was present, but the extremity was rigid. The right ankle jerk was absent.

She was admitted four weeks later to Lebanon Hospital, where she presented a typical lethargic encephalitis. There were double facial involvement, tremor of digits of both hands, and rigidity of both upper and lower extremities, together with stupor. Repeated questioning would sometimes elicit a whispering monosyllabic reply. Her temperature was never above 101.5° F. She died of a terminal hypostatic pneumonia, after a ten weeks' illness.

CASE II.—This case is of the fulminating variety. The patient was seen by Dr. Bennet three days before I saw her. She was a young married woman aged twenty-four, who first showed some catarrhal symptoms, headache and insomnia. She showed an acute Parkinson's disease with marked rigidity, tremors, suboccipital tenderness and Kernig's sign. The same day she was admitted to Lebanon Hospital, where she died in eighteen hours. A postmortem examination was performed. The piaarachnoid showed marked congestion over the convexity and base. A slight exudate was seen. The ependyma of the fourth ventricle was found congested. When I cut down into the tissue to examine the basal ganglia, I found nothing upon gross examination. The brain was left to be sectioned, but unfortunately the porter in trying to obtain new jars threw it away. Perhaps we could have confirmed Dr. Ramsay Hunt's findings that the lenticular nucleus, especially the globus pallidus, is involved in those cases that manifest acute Parkinsonian syndrome.

CASE III.—This case is of interest because of acute onset of cerebellar involvement. Male, aged thirty-six, had a cold for three days, together with insomnia and restlessness followed by drowsiness. I saw him three weeks later. He then showed a partial ptosis of the left eye, a nystagmus, with greater amplitude to the left, and a dysdiadokokinesia of the left upper extremity, together with a certain amount of hypermetria in performing the heel to knee test, on the left side. When standing he fell to the left. When walking he reeled to the left. Dr. Luttinger, his family physician, stated that his temperature hovered between 99° F. and 100° F., and never above this. There was no visible sign of involvement of the corticospinal pathways.

MYELONEURITIC TYPE.

Here the central grey and the white matter, the root ganglion and nerves show involvement.

On May 4, 1920, Dr. Walter Kraus presented a case before the New York Neurological Society, which showed a distinct involvement of the fifth and sixth nerves of the cervical region of the cord, involving the anterior horn cells, with a resulting winged scapula, and atrophy of the muscles of the arm and forearm. The early symptoms were those of epidemic encephalitis. This case showed the protean nature of the disease, and the thin ice we were treading in trying to differentiate this from a classical case of acute anterior poliomyelitis.

CASE IV.—This is a case of the radicular type. H. S., twenty-three years old, became sick the early part of January, 1920, his teeth pained him and he had pains in his ear. Five days later when I saw him he complained of severe pain in both arms and hands, and in the cervicodorsal region of his back. He presented wild choreiform movements of both upper extremities and of the lower extremities to a lesser degree. Accompanying this there were continuous chewing movements, and also swallowing. His speech became nasal in character, and he often stammered. On examination, his pupils were contracted, the right larger than the left, and reacted to light sluggishly. Nystagmoid movements were present, and the left sixth nerve was paretic. A history of diplopia was elicited. A distinct right facial paralysis was observed. Suboccipital tenderness was present, together with a slight stiffness of the neck. The right abdominal reflexes were absent. Knee and ankle jerk were diminished. A slight Kernig was elicited; no Babinski nor Oppenheim at this time. On February 10, 1920, I was told that he was drowsy for three days during the preceding week, his temperature was 101° F. He complained bitterly of pain which prevented him from sleeping. This was present in the forearms above his wrists and external surface of his arm and forearm, corresponding to C5 and C6, the right being more painful than the left. The chorea had ceased, and a coarse tremor with occasional jactitations was present in the digits of both hands. His facial paralysis was less apparent. The knee jerks and ankle jerks were more active. No Babinski was present, but an Oppenheim was obtainable for the first time, i. e., four weeks after the onset of the illness. He showed a distinct level of hyperalgesia from the fifth to the seventh cervical.

On February 20, 1920, his pupils were more dilated, reacted readily to light and in convergence. But he now saw objects one above another. The facial paresis was greatly improved, the abdominal reflexes were all present; knee jerks were lively, the Oppenheim was present, and a Gordon reflex was also elicited on the left side, but at no time was a Babinski plantar reflex present. He now complained of pain only in the right hand, limited to the ulnar nerve distribution. He showed no tenderness of the nerve trunks. On February 26th his status was about the same, but his sensory cord level was now down to the first dorsal. In the middle of March, 1920, his double vision had entirely disappeared;

the optic discs were not involved. Coarse tremors were still present, and an Oppenheim of the left lower extremity was elicited. He still complained of burning pain in the back of his neck.

CASE V.—This case showed both a radicular and a myeloneuritic involvement. A married woman thirty-two years of age was sick for seven weeks before I saw her. There was a history here of diplopia, and of having been in a lethargic state. The patient's pupils were equal and moderately dilated, reacting promptly to light and accommodation. Ankle jerks were present bilaterally, but the left knee jerk was diminished. She showed an atrophy of the left thigh group and a trophic skin disturbance. Severe pain was complained of in the cervical region, and a level of C5 and C6 hyperesthesia was present. There was segmental hyperesthesia corresponding to this level, involving the right deltoid and external surface of right arm. A Lesegue sign was present in the left lower extremity, together with tenderness along the sciatic. Another line of radiculitis was found at the lower lumbar and upper sacral region. The bladder was involved and this led to a cystitis.

CASE VI.—L. L., female, aged seventeen, a patient in the neurological clinic, in Dr. Climenko's service, of Mt. Sinai Hospital. She came in with her head resting on her left shoulder. A history of having been five weeks in bed was given, together with restlessness and insomnia. For the past three weeks she had had pain in the left side of her head and in her left arm. This arm had a pulling sensation; an occasional twitch was visible. Examination revealed a weakness of the left side of the face, a weakness of left upper extremity, and the head was deviated to the left. Pain was present in both upper extremities on passive motion. There was a distinct line of hyperalgesia of C5 and C6. This girl improved gradually, and she is holding her head erect again. She had not had her menses for the past three months.

PATHOLOGY.

The basic pathological condition can be epitomized to a vascular congestion and perivascular infiltration especially around the veins. A predominating number of lymphocytes are present, but plasma cells and polynuclear cells are also present. These hemorrhagic areas may be minute in size, and can hardly be detected macroscopically. The changes in the surrounding nervous parenchyma show different grades of degeneration, even neurophagia being noted, but to a far less extent than in poliomyelitis, as noted by Marenesco; another point is, there is less destruction of the parenchymatous tissue than in poliomyelitis. This has also been noted in poliomyelitis. This pathological condition has been noted in every portion of the affected nervous tissue.

BACTERIOLOGY.

Von Weissner recovered a gram positive diplo-streptococcus, which, it is stated, will produce somnolence when it is injected in monkeys. Wegforth and Ayer have inoculated monkeys with cord infiltrates from the infected human as well as spinal fluid injections, and their results were negative.

The most promising work in this field of investi-

gation, which is of the highest type of scientific endeavor, and is bringing results that are most convincing, is the work of Strauss and Loewe (13, 14). They have fulfilled Koch's law in every respect. They have produced lesions in monkeys that are characteristic of the disease, by means of the emulsion of the human infected brain, by filtrates derived from the nasopharynx of sufferers of this disease, and isolated an organism that is small and globular in shape, appearing in diploforms, chains or in clumps. The inoculation of this organism has produced the disease. The organisms were then recovered, and passed through generations of monkeys and rabbits. I have personally seen these globoid bodies, observed the stuporous animals, and the macroscopic and microscopic lesions, engendered by the organism. For diagnostic methods in the detection of this malady they have lately introduced a Shick epidermal reaction. The observation should be made, that the organism in some characteristics, resembles the one found by Flexner and Noguchi in poliomyelitis.

In consideration of the residual symptoms that this malady leaves behind, it is too early to see if they will remain permanent. On the neurological service of Dr. W. Leszynsky in Lebanon Hospital there is a man who has shown attacks of *petit mal* following encephalitis. At the Montefiore Hospital there are two cases of residual postencephalitis, one patient showing a Parkinsonian and the other a hemiplegic syndrome. The patient with cerebellar involvement, whose case is mentioned in this paper, still shows vertigo, when looking upward. One must therefore be guarded in the prognosis. The patient with a radiculitis with a sciatic neuritis showing atrophy of her muscles is a case in point. There is no true cerebral type nor any pure type in this affection. The cerebral form may combine with the radicular but it is the same disease.

In conclusion I wish to point out a rather obscure type of this malady which Dr. Reilly mentioned, and one case of which was seen on the neurological service of Dr. Leszynsky, in the Lebanon Hospital. This male patient gave the clinical picture of a man in coma, either of the nephritic form or of the diabetic type. In addition to this he showed glycosuria. We know that a great proportion of sufferers of this affection have shown sugar in the urine. Dr. Reilly mentioned a few cases of this type that came under his observation. This patient showed very marked spasmodic abdominal muscular contractions. These contractions have been noted in different parts of the body, resembling myoclonic muscular contractions. Dr. Abrahamson has pointed out that the muscles so affected always corresponded to the line of spinal hyperesthesia elicited.

TREATMENT.

The treatment is purely symptomatic. Some efforts have been made in the use of serums and vaccines, but no success has attended this field of endeavor. Lumbar puncture at times seemed to afford some relief for the symptoms, but this was short lived. It should only be used where there is marked meningeal irritation. Good nursing is the best treatment.

In the residual symptoms that this disease engenders, massage, which should be applied lightly, is often indicated. In those cases that show contractures, the earlier the immobilization with overcorrection the better the prognosis. I wish to take this opportunity for thanking Dr. William Leszynsky, Dr. Hymen Climenko and Dr. Carl Goldmark for allowing me to quote some of their cases.

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1187 BOSTON ROAD.

ENCEPHALITIS LETHARGICA.*

Report of Eleven Cases.

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Through the courtesy of Dr. Neff, I beg to present before you a paper reviewing the cases of encephalitis lethargica at the Harlem Hospital. Before proceeding with our own cases, I shall first give a résumé of the literature on the subject.

DEFINITION.

Accepting Sainton's definition we may classify it as "a toxic infectious epidemic syndrome characterized clinically by triad lethargy—ocular palsies and a febrile state—and anatomically by a more or less diffuse encephalitis most marked in the gray matter of the midbrain."

HISTORY.

In the middle of 1917 Von Economo reported a number of cases appearing in Vienna in epidemic proportions characterized by somnolence—almost simulating sleeping sickness, and very illogically called it encephalitis lethargica, for not all the patients are lethargic. Many of them really suffer from insomnia and are very restless. In March, 1918, Breinl reported nine cases observed in Australia. About the same time that these observations were being made in Australia, similar cases were under investigation in France and England, and later reports from Italy and Uruguay give evidence that the disease was worldwide in its distribution. This disease is not a new one, as similar epidemics

have been reported as early as 1712 and others in 1891, following pandemics of influenza. So we see that the present epidemic first appeared in eastern Europe and in Australia, then it spread westward reaching France and England early in 1918, and in this country in the fall of the same year. The first case in this country was observed in Major Tasher Howard's service at Camp Lee, Va., in November, 1918.

PATHOLOGY.

We have had opportunity to examine the brains in two cases in which complete necropsies were performed. The appearance of these two brains was very similar. The gross changes consisted of edema and marked congestion. The histological changes were also similar in the two cases and were mainly found in the basal ganglions and brain stem. They consisted principally of dense accumulations of mononuclear cells around the vessels and of small hemorrhages. There was little evidence of necrosis or of extensive tissue destruction, in which respect this disease differs from poliomyelitis.

SYMPTOMS.

The outset of the symptoms was always insidious. The first suggestive symptom has been blurring of vision, with more or less definite diplopia, together with progressive listlessness which when pronounced has been called lethargy. The facies gradually becomes extremely characteristic with masklike immobile features, half open eyes and a fixed, more or less distorted position of the mouth. The patient does not sleep as much as is indicated by the sleepy expression. In fact, some of the patients actually suffer from insomnia. Thus we see that the lethargic appearance is only a sign of the involvement of the cerebral mechanism. In one of our patients there developed distinct choreiform movements with labored respiration and weak, rapid pulse. Retention of urine was a common symptom observed in our cases. The urinary apparatus has its centre, according to recent investigation, in the basal ganglion, which is the favorite site of the inflammatory changes in this disease. Fever is usually present to a variable extent, but like the lethargy does not bear a direct relation to the amount of infection present. Headache, malaise and weakness are common symptoms, noticed in the early stage of the disease. Orientation was usually unaffected just until death, and a very important symptom was a sense of euphoria which almost all of our patients had when aroused and questioned as to their condition.

REPORT OF CASES.

Our own experience at Harlem Hospital with encephalitis lethargica dates back to September, 1919.

CASE I.—P. S., male, white Russian, aged thirty-eight, was admitted to the institution September 28, 1919. Chief complaint was headache of two weeks' duration. His daughter was at that time at Mount Sinai Hospital, ill with encephalitis lethargica. His headache came on with an upset stomach, felt very weak, was sleepy, and could not see with the right eye. Physical examination revealed the patient in lethargic state. Bilateral ptosis was present, the tongue and mouth deviated to the right,

*Read before Harlem Hospital Medical Society, April 6, 1920.

there was diminished power in upper extremities, Kernig and Babinski were positive. There was left facial weakness and the neck was rigid.

The laboratory findings were as follows: Blood, white blood corpuscles 10,000, polynuclears sixty-one per cent.; lymphocytes thirty-nine per cent., blood pressure 140, 95, urine negative, blood and spinal Wassermann negative, spinal fluid came out under no pressure, was contaminated with blood, twenty-two cells per mm., Fehling slightly positive, Noguchi slightly positive, no organisms were found; temperature 103° to 99.4°, pulse 112 to 90, respiration 24 to 20.

His eyes, examined by Dr. Cohen, showed myopic changes in the left eye, with internal strabismus, dislocated right calcareous lens with complete retinal detachment. The pupils were equal and reacted to light and accommodation. There was a calcareous deposit in right anterior chamber of the eye. Later findings showed ocular paresis, urinary retention, left abdominal muscles less active than right. The patient was discharged as cured October 22, 1919. In this case the early tendency to oculomotor disturbance indicates primary involvement of the upper part of the brain stem around the aqueduct of Sylvius and the third ventricle.

In reviewing the literature of encephalitis lethargica complicating pregnancy I find only eight cases reported. The mortality is far higher in females than in males. The mortality rate in pregnant women is very high.

Out of the eight cases reported five of the patients died, one recovered, and in the other two the outcome was not reported. In the Harlem Hospital we had four cases complicating pregnancy; three patients died, one recovered.

CASE II.—B. M., aged twenty-six, white, Hungarian. Admitted January 5, 1920, to Dr. Broadhead's service for delivery of second child. On January 6th, the patient complained of headache, pain in neck and vomiting. Dr. Langrock examined the patient and stated that her pregnancy did not account for her condition. Spinal puncture was performed and twenty c. c. of clear, colorless fluid under moderate pressure was withdrawn; twenty cells to the c. mm., Noguchi positive, Fehling negative, no organism was demonstrated. The urine was negative. The patient became irrational. The reflexes were exaggerated. The Kernig was positive, Babinski positive. The patient had urinary retention and died January 8, 1920.

CASE III.—L. F., female, aged twenty three, white, Hungarian. Admitted February 7, 1920, because of pain in back. Was sick at home for a week, and on admission a diagnosis of pneumonia was made. Physical examination revealed well developed physique in lethargic state. There was no evidence of consolidation in the lungs. The posterior pharynx and tonsils were the seat of a marked inflammatory process with large amount of mucus exudate. The neck was rigid, Kernig positive, left sided facial paralysis. On February 10th, there were automatic movements of left upper extremities, and a clonic convulsive action of right lower extremity.

The fundus of the bladder reached to the umbili-

cus. The patient was catheterized and sixty-eight ounces of urine withdrawn. The fundus of the uterus was about three fingers below the umbilicus, and Dr. Broadhead believed that she was probably four months pregnant.

Laboratory findings: Blood—red blood cells, 4,200,000, white blood cells, 13,200, polynuclears eighty-six per cent, lymphocytes, fourteen per cent., urine negative. The spinal fluid came out under moderate pressure clear and colorless. There were thirty cells to the c. c., lymphocytes 100 per cent., Fehling positive, Noguchi negative, no organism demonstrated. Temperature 103° to 98°, pulse 122 to 138, respiration 26 to 34. The patient died February 11, 1920.

CASE IV.—C. D., white, aged 20, married, pregnant, was sent in by Dr. Cherry to Dr. Hayne's service, March 18, 1920, with tentative diagnosis of toxemia of pregnancy. The patient had enjoyed good health throughout her pregnancy. Two weeks ago she began to have severe headaches, sleeplessness, and vomited once. She also noticed that her vision was defective. For past five days she has been extremely drowsy, and hard to waken; and for last forty-eight hours has been picking at the bed clothes, and was irrational. Dr. Garretson examined the patient and reported the following:—"Cranial nerves negative. Can open both eyelids, left appears slightly paretic, extrinsic ocular muscles apparently balanced. Reflexes, upper extremity normal and equal, lower extremities, patella reflexes absent, plantar present and normal, sensation responds to tactile and pain normally." The patient gave no history of convulsions and there was no edema of the lower extremities. Laboratory findings: Urine, 3 plus albumin, blood pressure systolic 175, blood, white blood corpuscles 16,600, polynuclears, eighty-five per cent., lymphocytes fifteen per cent, a spinal puncture was performed and gave a clear, colorless fluid under slight pressure. There were no cells, Noguchi was slightly positive, Fehling positive, no organism was demonstrated. The patient died March 21, 1920.

CASE V.—A. G., white, single, eight months pregnant. Admitted February 13, 1920. Complained of headache, pain in back of neck and fever which began two weeks ago. She became drowsy and felt so weak that she had to stay in bed. Physical examination revealed adult female in lethargic state. The pupils were equal and regular, reacted to light and accommodation, no strabismus, rotatory nystagmus of right eye, with weakness of right levator palpebræ muscle. The uterus was enlarged to the size of an eight months' pregnancy. The knee jerks were present, Kernig present, Babinski ankle clonus and Brudzinsky not obtained. Lumbar puncture performed and twenty-five c. c. of clear spinal fluid obtained under no pressure.

The laboratory findings were, thirteen cells to the c. m., Noguchi negative, Fehling positive, no organism was demonstrated. The urine showed a weak trace of albumin, no sugar, granular casts with red and white blood cells. The patient was transferred to the obstetrical ward, pronounced cured, where she gave birth to a baby boy March 26, 1920.

CASE VI.—M. B., aged nineteen, white, married, Austrian. Admitted January 19, 1920, because of marked headache and weakness, loss of appetite and general malaise. Physical examination revealed a poorly developed female, anemic, and in a lethargic state. The muscles of the neck were rigid, Kernig positive. A clinical diagnosis of tuberculous meningitis was made and spinal tap was performed, twenty c. c. of clear colorless fluid under pressure was withdrawn. The laboratory findings were, twenty cells to the c. mm., Fehling negative, Noguchi slightly positive, no organism was demonstrated. The temperature was 102° to 104.5°, pulse 150 to 155, respiration thirty-four to forty. The patient died January 22, 1920.

CASE VII.—M. G. aged thirty-two, U. S., married, admitted January 27, 1920. Ten days prior to admission she complained of headache and pain in orbital region. She also complained of diplopia which lasted four days. On the fifth day the diplopia disappeared and the patient went into a lethargic state. Three days ago there was noticed a muscular twitching of the face and tongue, and the protruding tongue was deviated to right side. This condition kept up till February 3rd, when the temperature came down by lysis from 102° to normal and the patient was discharged as cured.

CASE VIII.—This case differs from the others by the absence of somnolence and the presence of choreiform jerking movements. The patient was irritable and had an anxious expression. The patient was a young girl, white, fifteen years of age, admitted February 18, 1920, because of pain over the head which had continued for two weeks. Had diplopia ten days ago. Physical examination revealed young girl well developed, with labored breathing. Herpes were present on the lips, ptosis of right eyelid, pupils were equal, Kernig positive, no Babinski or Brudzinsky. The next day the patient became violently delirious which necessitated restraining her in bed. She had many absurd illusions. While the lumbar puncture was done the patient seemed to pay no attention to the entrance of the needle. A clear, colorless fluid under moderate pressure was withdrawn.

The laboratory findings were 350 cells to the c. mm., Noguchi positive, Fehling positive, no organism was demonstrated. Blood, white blood cells 23,000, polynuclears 84 per cent., lymphocytes 16 per cent., temperature 103°-100°, pulse 120-145, respiration 42-20. On February 21st the patient went into coma and died February 22nd.

The necropsy was performed by Dr. Cassasa, and he found the following: scalp negative; skull negative; dura normal. Brain: Extreme congestion of brain; vessels in the sulci markedly dilated and branches over the convolutions markedly congested. The congestion was of a crimson color. The sulci and convolutions were very well marked. There was no free fluid in the pia arachnoid meshwork over the cortex of brain. The knife was passed in a horizontal plane in a lateral direction over corpus collosum. The first three or four cervical segments of brain were also removed. The brain and cord were put in formalin to be examined for epidemic encephalitis.

The right pleural sac was completely obliterated by old adhesions. The right lower lobe was firmly adherent to the chest wall and diaphragm. In the left pleural sac, over lower lobe there were old adhesions; section of right lung; upper and middle lobes normal, showed no congestion or edema. The right lower lobe over its entire extent was markedly congested and consistency increased. There was no distinct granulation on section. The upper lobe of the left lung was normal; no congestion or edema. Along the costal vertebral border of the lower left lobe there was an area of congestion about an inch deep; on section this area was black, not granular and slightly firm.

There was no dilatation of the right heart. The pericardial sac was normal, heart muscle good color. Right and left heart contained a soft, dark red blood clot. Stomach, intestines, and appendix normal. The liver was yellowish red, and showed large areas of a lighter yellow, giving it a mottled appearance. The spleen was slightly enlarged. On section, the pulp was slightly exaggerated. The pancreas was normal. The cortex of the kidneys was smooth, grayish yellow; slightly dull and intralobular vessels markedly injected. The bladder was contracted and empty. The entire mucous surface showed a hemorrhagic cystitis. The uterus, tubes and ovaries were normal. Sections were taken from the bladder, spleen, liver, heart muscle and brain. The final report was encephalitis lethargica.

CASE IX.—M. G., aged forty-five, colored, married. Admitted March 6th, complaining of headache and pain throughout body. Patient later became drowsy and fell into a lethargic state. Had ptosis of both eyelids and slight rigidity of the muscles of the neck. The Kernig was positive; Babinski and Brudzinsky negative. Spinal puncture performed and twenty c. c. of clear, colorless fluid under moderate pressure withdrawn. The laboratory findings were twenty cells to the c. mm., Noguchi positive, Fehling positive, no organism was found. The blood showed, white blood corpuscles, 14,400, polynuclears 76 per cent., lymphocytes 24 per cent. The temperature was 100°-102°, pulse 100-124, respiration 30-40. The urine was negative, blood pressure was 122/100. The patient is still in the hospital convalescing.

CASE X.—One of the most interesting cases we had was that of J. L., aged thirty, white, Italian. Admitted February 22nd, with chief complaint of headache. Headache lasted seven days, and then the patient became drowsy; had pain in legs, and then became semiconscious.

Physical examination revealed a well developed and nourished young Italian, semiconscious, answering questions intelligently. When roused from his lethargy, having a sense of euphoria and manifesting twitching of arms, fingers, eyelids, and occasionally of the face, ptosis of both eyelids; no ocular paresis, knee jerks exaggerated bilaterally, no definite Kernig, positive Babinski, no ankle clonus. Spinal puncture was done February 23rd. The specimen was contaminated with blood and came under slight pressure.

The laboratory findings were, Fehling positive, Noguchi positive, and the sediment showed encap-

sulated diplococci resembling pneumococci. A diagnosis of pneumococcic meningitis was made with the feeling that the organism demonstrated was merely a contamination.

February 28th, lumbar puncture was done, ten c. c. of the fluid slightly contaminated with blood was removed under slight pressure and eight c. c. of patient's own serum injected intraspinally. The specimen showed, Fehling positive, Noguchi positive. No organism was demonstrated this time and the sediment culture was also negative, so we changed our diagnosis to encephalitis lethargica.

In looking over the literature on this subject, I find that no one adequately explains the cause of the lethargy seen in this disease. I beg to offer the following explanation and invite your opinions on this matter. In disorders of the hypophysis we find that lethargy is a very important symptom, and by administering the extract of the anterior lobe of the gland we can at times cure a case of lethargy due to hypopituitism. Now since the pathology of encephalitis lethargica shows a perivascular infiltration of the pons and medulla, I feel that by virtue of its anatomical relationship to the hypophysis by means of the infundibuliform process, it is rational to theorize that the lethargy is due to a hypopituitism resulting from the pathological condition extending to it.

The early occurrence of lethargy points to its being a focal symptom rather than an expression of intoxication of the higher brain centres. In otherwise mild cases with good complexion and clear tongue the lethargy may be well marked. In other words the lethargy bears no relation to the amount of infection. Hence, it is safe to assume that the lethargy sets in just as soon as the hypophysis becomes involved.

SUMMARY

In summarizing I wish to state that while the literature reports that the disease is more common in males than in females, our experience has been otherwise. Of our eleven cases, there were seven females and four males. Five of the female patients died—(three were pregnant). Out of the four male cases, one patient died and three recovered, which bears out the experience that the disease is more fatal to females. All of our cases may be classified as encephalitis lethargica. The onset was always insidious, with headache, malaise, weakness, vertigo, sore throat, diplopia and fever as common symptoms. Drowsiness occurred in almost every case, frequently developing into coma, and at times alternating with irritability and anxiety. Long projection fibre tracts to the arms and legs showed disturbances in some of our cases as indicated by spasticities, and Babinsky reflexes. The symptoms and signs referable to the brain stem were found in all our cases, together with oculomotor palsy. Weakness of the facial muscles was also characteristic. The pathology and symptomatology in our series corresponded very closely to that described by the men abroad and here. As to the etiology of lethargy I offer in explanation disturbances of the pituitary body due to the extension of pathological condition from the pons and medulla by means of the infundibuliform process which extends from the base of the brain to the hypophysis.

ENCEPHALITIS LETHARGICA IN FRANCE AND SWITZERLAND.

BY CHARLES GREENE CUMSTON, M. D.,
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The clinical aspect of this morbid process since cases have become more numerous may, perchance, cause its name to be changed, but until we possess more information concerning it, I think the term encephalitis lethargica may be retained, although it is not quite correct, because most of the press communications have been printed under this heading. The history of this morbid process is, up to date, rather brief. It was observed by Camerarius and also by Sydenham, while in 1889-1890 the Italians referred to it by the name of nona, but it was von Economo, of Vienna, who, with other workers, described the disease in 1916-1917. In 1918 the disease appeared in England and France, and after a period of quiescence, it again developed in Italy, France and Switzerland, where cases have become more numerous ever since. First encountered in the Parisian suburbs, it extended over vast territories, especially Alsace, Cherbourg, in the Loire and Bordeaux. Nearly all the Swiss cities have been affected by it and at Geneva to date we have had more than twenty-two cases, which is a fair number for a city of one hundred and forty thousand.

It may be assumed to be an infectious disease, its morbid agent as yet unknown and producing lesions preferably in the mesocephalon. The symptomatology is regarded as being represented by three principal phenomena, namely, fever, paralysis of the third cranial nerve, and somnolence, but, as I shall show, this is subject to revision. The prognosis is variable and treatment uncertain. Although moderately contagious the disease is unquestionably transmissible by the intermediary of the bucconasopharyngeal mucus, a transmission similar to that of influenza, and it is remarkable that epidemics of the latter affection appear coincidentally with the appearance of encephalitis lethargica.

The symptomatology as encountered in France has been well described by Netter. The disease is usually febrile, commencing with headache and occasionally vomiting. Somnolence rapidly supervenes and becomes progressively accentuated. At first there is drowsiness only and this is followed by a true sleep from which the patient can be aroused, will reply to questions, and walk about, but as soon as he is left alone he will relapse into sleep. At a more advanced phase sleep may be interrupted by delirium, tremor, and exceptionally convulsions. Usually, however, there is only sleep. The muscular system of the eyes is almost always involved—paralysis of eyelids, nystagmus and rarely diplopia. Somnolence, headache, and ocular disturbances naturally lead one to suspect meningitis, simple, cerebrospinal or tuberculous. However, the ordinary signs of meningitis are wanting or only slightly marked. The meningeal line can be readily provoked and although pressure of the globes is painful, irregularity of both pulse and respiration is generally absent. Stiffness of the neck and Kernig's sign are slight or absent. Lumbar puncture gives a clear fluid containing a normal percentage of albumin and from two to three cell elements, rarely as many as seven. Cultures of

the cerebrospinal fluid remain negative. Therefore, if the physician is not on his guard, a diagnosis of cerebral tumor and especially tuberculosis of the cerebellum will be made. If the affection is prolonged and the subject recovers, such a presumption might seem justified, but if death ensues no trace of tubercle will be found. Both the surface and sections of the brain appear normal or simply injected with a diminished consistency. The evolution of the process is variable. Some subjects die within a few hours of the onset, others as late as the seventeenth day. Some recover in a few days, others after several weeks.

This describes the type of encephalitis lethargica most frequently observed, but the significance of the symptoms presented should be given careful consideration. Let us consider the three principal symptoms separately.

The fever denotes an infection of the organism but it is irregular in the intensity of its manifestations. In a large number of cases the temperature remains in the neighborhood of 100.5° to 101.5° F. In others it goes to 102°, 103° or even 104° F., and it seems now logical to assume that the height of the temperature is in direct relation to the gravity of the infection. There are instances where no thermic rise has been observed. When there is fever the morning remission is sometimes very trifling.

The fever is accompanied in most cases, and occasionally preceded by, other evidences of infection, among which slight chills, an increased pulse rate, vomiting and coated tongue are to be noted. It is usually these symptoms with a rise in temperature that mark the onset of the disease but at the same time they appear the patient will complain of headache. This clinical picture is quite constant and those patients too sleepy to reply to questions keep their hands on their foreheads thus indicating cephalalgia.

The somnolence which is present has given its name to the affection and it would consequently seem that it exists in all cases, but instances are reported in which it was absent. However, it may be regarded as one of the most constant symptoms. It varies greatly in degree, duration and time of appearance, but it should be regarded as one of the earliest signs and when the general symptoms are not marked it is the first one to be manifested. Therefore, in those cases where the diagnosis has been made from somnolence alone it will probably be correct in the majority of instances.

In a large proportion of cases the somnolence is continuous, the subject appearing like one in ordinary sleep. If he is called or an attempt made to arouse him from his stupor he will awake, but if left alone sleep returns. When the subject replies to questions he does so in the weary way of a person who wants to sleep. In other cases the somnolence is less profound, the patients having the look of one merely tired and attempting to do no more than possible. In reality, they are fighting against sleep—and some subjects resist it to such a degree that they try to get up and be about in order to overcome the somnolence.

If they accomplish their end they stagger about and, obliged to give up, fall into a state of lethargy.

Patients in hospitals have been known to get up, make their beds and then fall asleep. Finally, certain patients present a true narcolepsia, more like coma than ordinary sleep. The muscular system is absolutely relaxed, the eyelids remain closed, and if they are raised the pupils will be found turned upward as in normal sleep. This fact has been referred to by F. Lévy, who has also observed an incontinence of urine and feces in complete coma. The duration of the somnolence is variable, lasting from a few hours only to several weeks if not months. It frequently continues after the disappearance of the general symptoms, especially the rise in temperature.

In the earlier descriptions of the ocular phenomena of encephalitis lethargica, the paralysis was said to involve almost exclusively the motor muscles of the eye, but of late they have been singularly increased and they are unquestionably very valuable diagnostic signs. Morax and Pollack have given particular attention to their study. These observers have pointed out the integrity of the sensory and sensitive functions of the visual apparatus to which is opposed an intrinsic or extrinsic involvement of the motor apparatus of the ocular globe. Bilateral incomplete ptosis is an almost constant symptom, although sometimes quite fleeting. Strabismus is less constant and generally convergent, appears at the onset of the disease, and quickly disappears. Diplopia is variable, often atypical and should be looked for in extreme movements. There is an almost constant presence of disturbances of the associated movements, especially the vertical. These disturbances are to be opposed to the rarity of a limited involvement of one oculomotor nerve.

The frequency of unequal pupils and the constancy of paralysis of accommodation should also be noted. It is common to observe that some of the ocular signs, particularly nystagmiform disturbances in the movement of elevation, persist after the clinical recovery from the disease, or at least subside very slowly. But the paralyzes are not confined to the muscles of the eye and other nerves originating in the mesocephalon may be involved, such as the common oculomotor, facial, hypoglossus, glossopharyngeal and pneumogastric. Facial paralysis has been especially observed and Sinton had a case of complete immobility of the expression.

It may be proper here to refer to paralyzes met with in the territories of entirely different nerves, such as fleeting paralysis of the limbs, epileptiform convulsions reported by Khoury and Chauffard, clonic movements referred to by Halbron, and sudoral paroxysms mentioned by Khoury.

Among accessory symptoms may be mentioned asthenia which, although almost constant, may, when existing alone, be regarded as an outcome of somnolence. Retention of urine has been mentioned by Halbron, Souques, and Lereboullet, multiple neuralgia by Netter, Salmont and Léry, rather durable confusional states by Claude, tremors and exaggerated reflexes by Lhermitte and Babinski's sign.

The evolution of encephalitis lethargica is extremely variable. There are subacute cases with a small thermic rise or even none whatsoever, where all the symptoms are little marked and result in rapid re-

covery. There are hyperacute forms ending in death in a few days. The ordinary acute types end in death by a progressive aggravation of the symptoms or, on the contrary, by a remission of the symptoms announcing a favorable issue, although this may take several months. The prolonged cases reported by Netter and Sinton, where it took two, three or more months for recovery to take place, were particularly numerous in the Vienna epidemic of 1917. Chauffard and others have described ambulatory forms which did not prevent the subject from continuing his ordinary duties, but Lortat-Jacob states that in them there was diplegia, nystagmus and a perpetual tendency to sleep. Sicard and Kudelski have described types particularly distinct from the typical cases, which they propose to call acute myoclonic encephalitis, characterized at the onset by lancinating pain, moderate fever and headache, while in the phase of full development short, rapid, explosive muscular jerkings are noted—having the electrical rhythm—located in the muscles of the limbs, face, and diaphragm or localized to a section of the body, sometimes with a tendency to generalize. There are no ocular symptoms or somnolence. Then delirium appears, usually the oneiric type, and coma supervenes, although the jerkings continue. These observers have also described relapsing forms in which the patient, rather seriously ill, presented a remission for a couple of weeks during which he returned to work and then relapsed for several months.

Achard, of Paris, and Cramer and Koch, of Geneva, have referred to the clinical diversity of this morbid process. The modalities of the intensity of the somnolence, the symptoms of excitement replace those of depression, etc., so that we must conclude that the disease is both polymorphous and acyclical. The Paris and Geneva observers have shown that the microscopic lesions are seated in the cerebral cortex and especially the ganglia, in the protuberance and bulb. The vessels are surrounded by cuffs of cells particularly in the gray matter of the third ventricle, the aqueduct of Sylvius and in the nuclei of the motor nerves of the eye. The nerve cells undergo morbid changes. From the quite considerable number of autopsies made to date it is evident that the lesions of encephalitis lethargica are seated in the mesocephalon surrounding the ventricles and are microscopically of little import, the conjunctivovascular changes being the most marked. Netter and others who just described this disease maintained that the cerebrospinal fluid was normal but we now know that such is not the case and that a mild lymphocytosis is common in the advanced phases of the affection and even a marked one may be found, but the percentage of albumin remains normal. Let me add that there are still some observers who are in doubt on the subject of lymphocytosis so that more work along these lines must be forthcoming before any exact conclusion can be reached.

Of the diagnosis and prognosis of encephalitis lethargica it is quite unnecessary for me to speak, likewise of treatment which is still a matter of study, but in conclusion I would briefly refer to the nature of this interesting morbid process. I have considered encephalitis lethargica so far as a perfectly distinct

affection due to an infectious agent belonging to the class of filterable virus and as yet unidentified. This is the opinion of most observers on the continent but in this respect opinion is not uniform and perhaps it is not devoid of interest to refer to this aspect of encephalitis lethargica.

In 1917, Cruchet described a diffuse encephalomyelitis which assumed divers clinical forms: mental, convulsive, choreic, meningitic, pontocerebellar, bulboprotuberantial, etc., and he believed that encephalitis lethargica was one of the types of this encephalomyelitis. Lhermitte and some others maintain that encephalitis lethargica is simply a syndrome, the expression of an infectious process in the mesocephalon. Page recalls that Sinton's cases seem to be related to an influenzal infection, that one of Lortat-Jacob's was related to syphilis, and that Lesage and Abrami have described a somnolent type of tuberculous meningitis. Comparing these facts with two cases of his own in which the encephalitis lethargica was merely an episode in the evolution of tuberculosis, Page believes that several toxins—one being that of tuberculosis—are susceptible of adulterating the hypnic centre which appears to be located in the mesocephalon and whose involvement, although temporary, produces the syndrome of encephalitis lethargica.

What is more important, however, as Cruchet has pointed out, is the cause of this involvement of the nervous centres. Netter, who sees an unquestionable analogy between encephalitis lethargica and poliomyelitis, maintains that the former is a specific morbid process with a well defined virus of its own and he opposes the opinion which has been expressed upon several occasions that the disease under consideration occurs with epidemics of influenza and assumes that the former process is due to influenzal virus or some associated microbe, such as those giving rise to influenzal pneumonia. This opinion is also opposed by Cruchet and Claude, the latter observer pointing to the fact that the cause may not be universal. All this is to come back to the conception of an encephalitis syndrome that several toxins may be capable of producing.

INTRAVENOUS AND INTRASPINOUS TREATMENT OF MENINGOCOCCUS MENINGITIS.*

By DAVID GOLDBLATT, M. D.,
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The one outstanding contribution to the study of meningococcus meningitis during the past two years is the conception of the infection as a generalized one primarily, with secondary localization in the meninges. The disease had previously been studied carefully by Flexner and his associates at the Rockefeller Institute, and they have demonstrated that the infection was the result of direct transmission of the organism into the meninges by way of the cribriform plate of the ethmoid.

But it was mainly through the work of Herrick and his associates at Camp Jackson, where many cases of meningitis have been studied, that we came

*Read before the Harlem Hospital Clinical Society.

to recognize the disease as a generalized infection. Workers at other camps and especially Haden, at Camp Lee, have confirmed this view. Of course it had been long known that there was a type of the disease, fulminating in character, in which the infection was evidently generalized. But it had been held by most observers that the majority of cases were primarily a localization from the outset.

Coupled with the conception of the disease as a generalized one there have been new ideas brought forward for treatment. It has been shown that intravenous therapy markedly influences the course of the disease. This result is well illustrated in the Camp Jackson series, where with intraspinal treatment alone the mortality was 34.3 per cent., and in the combined intravenous and intraspinal treatment the mortality was 14.8 per cent. Herrick also emphasizes that it is in the more severe cases that the newer method is more effectual. Intravenous therapy also decreases the number of intraspinal treatments, and the harmful results from continued intraspinal treatment have not been sufficiently emphasized.

The majority of bad sequellæ following intraspinal treatment are due to a myelitis of the cauda equina, the direct result of trauma incidental to a lumbar puncture and the introduction of serum intraspinaly; and these explain the pain and stiffness of the back and legs. Rosanoff from a study of twenty-six cases, describes what he calls a uniform postmeningitic syndrome.

Objection has been raised to the intravenous treatment by several workers, especially by Neal, who states that intravenous therapy neutralizes the toxins and destroys the organisms circulating in the blood stream, and since the ability of the choroidal plexus in filtering through antibodies is still questionable, it would not influence the localized condition. But, I believe, we are justified in assuming that by destroying the organisms in the blood stream and meninges by the combined therapy, we preclude the possibility of a reinfection, which is not as uncommon as one would think. Herrick reports seven cases of reinfection occurring within several weeks or months of the primary infection.

Prompted by the good results obtained at the army camps, we decided to try the combined treatment at the Harlem Hospital and prove for ourselves the value of it. We cite the following case in confirmation and corroboration of the treatment outlined above:

CASE.—Patient A. S. D., aged eighteen, female, was brought into the hospital February 15, 1920, complaining of headache, pain in the back of the neck, and fever of two days' duration. Her mother and father were well and living in Porto Rico, her native land. She had no infectious diseases during childhood or thereafter, and no operations. The menstrual cycle first appeared at twelve, being of the monthly type and flowing for two or three days. She had been married for two years and had no children or miscarriages. Venereal diseases were denied by name and symptoms. Her habits were irrelevant. Her present illness dated back to three weeks prior to admission to the hospital, when she experienced a chill which wakened her from

sleep and lasted for about half an hour. Following this she was delirious for several hours, and remained in bed for a week, at the end of which time she felt well enough to go to work. This she did for about a week. At the end of this time, while at work, she experienced a sudden severe headache, vomited and was feverish. She immediately went home where she remained for two days until her admission to the hospital. The pain in the head persisted, and associated with it were pains in the back of the neck and upper part of the back. There was no history of cough, expectorations, sweats, or hemoptysis.

The physical examination revealed a well developed and well nourished, apathetic, young white woman, appearing acutely ill, and apparently unconcerned about what was going on about her.

Temperature, 105°; pulse, 116; respiration, 24. On touching the neck or upper portion of the back she complained of pain. The skin was soft, warm, moist and free from rashes. The examination of the head and eyes were negative, with the exception of weakness of the right internal rectus. The breath had a foul odor, the lips were dry and crusted, the tongue was coated with white fur, and the throat was injected. The neck was markedly rigid, there being limitation of motion from side to side as well as from before backward. The examination of the chest, lungs and heart proved negative; the pulses were equal, full and bounding, but rapid. Blood pressure, 120-70. The abdominal findings were negative, with the exception of slight tenderness in the hypogastrium; the liver and spleen were not enlarged; the kidneys were not palpable. The superficial lymph glands were not enlarged. The knee jerks were equal, very active, and no Babinski or its modifications could be elicited. Brudzinsky's and Kernig's signs were both strongly positive.

The urine was negative with the exception of a few red and white blood cells. The white blood count was 12,400, with 78 per cent. polynuclears and 22 per cent. lymphocytes. The blood culture was negative on two occasions. The spinal fluid was cloudy, and under pressure had 850 cells to the c. c. with 61 per cent. polynuclears and 39 per cent. lymphocytes. The Noguchi test was positive and the Fehling test negative. No organism was demonstrated in this first examination. Subsequent spinal fluid examinations showed a variation of total cell count from 500 to 1100 cells to the c. c., with 75 per cent. to 99 per cent. polynuclears.

On February 25th a gram negative intracellular diplococcus, having many of the morphological characteristics of the meningococcus, was demonstrated. This was the sixth spinal puncture.

Reviewing the history and bearing in mind the mode of inception of the disease in this case, I believe we can rightly assume, that the condition apparently began as a generalized infection which was rather mild, not prostrating the patient, but later localizing in the meninges and there manifesting its virulence. The interval of apparent freedom from symptoms as demonstrated in this case has been vividly brought to notice by many of the cases in the army, where soldiers were ill and incapacitated for

several days, to return to duty at the end of this time, and two to three weeks later be readmitted with frank manifestations of a meningitis.

Considering the case as one of meningococcus meningitis, although the first spinal fluid examination did not show the organism, treatment was instituted as follows:

The patient was first tested for sensitization to horse serum and at the end of a half hour, the reaction being negative, 100 c. c. of antimeningococcus serum were given intravenously. This was followed eight hours later by a lumbar puncture with the injection of fifteen c. c. of serum intraspinally. Twenty-four hours after the first intravenous injection, 100 c. c. were again administered intravenously. Twenty-four hours later ten c. c. of serum were given intraspinally. Thus intravenous and intraspinal treatments were alternated for four doses, at time intervals ranging from eight to twenty-four hours, and the temperature coming down to 100° F., the patient was left alone to see what would happen. At the end of this free from treatment interval the temperature rose to 103.5° F., and an intraspinal treatment of twenty-five c. c. was given. The next day the temperature dropped, but within twenty-four hours rose again and assumed a definitely septic character for three days. During these three days intraspinal treatment alone were used to see the effect of this treatment. We now decided upon an energetic intravenous treatment alone, to see what effect this route of treatment would have upon the disease. For four days a daily injection of serum was given intravenously, beginning with eighty c. c. the first day and sixty c. c. every following day. At the end of this treatment the temperature came down to 100° F., and did not go any higher for six days. On the seventh day a lumbar puncture was made and the fluid was reported as being almost normal, there still being a slightly positive Noguchi. On this day following the intraspinal administration of serum, a routine after each spinal puncture, the temperature rose to 102.5° F., and came back to normal within twenty-four hours. I believe this rise in temperature was due to a partial injection of the serum into the connective tissue between the dura and the bone, as the patient complained of pain during the administration.

In closing I would like to emphasize the salient features of this treatment and although I am aware that one case is not sufficient to draw conclusions from, I cannot help being impressed by the marked improvement in this patient after energetic intravenous therapy.

CONCLUSIONS.

1. Intravenous therapy combined with intraspinal treatment, aims at a rapid sterilization of the blood and meninges and thus shortens the period of morbidity.

2. Intravenous therapy reduces the required number of intraspinal treatments, and if started early may abort the disease.

3. With a moderate amount of care the intravenous therapy is free from danger and should be used in cases that clinically indicate a severe type of the disease.

AN EPIDEMIC OF TYPHOID FEVER OF WATER BORNE ORIGIN AND CARRIER TRANSMISSION.

At Camp Hospital No. 10, Prauthoy, Haute Marne, American Expeditionary Forces, France.

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(Continued from page 150)

CARRIERS.

CASE I. (19) Private Battery E, 320 F. A. Admitted February 9, 1919, as a result of the isolation of *Bacillus typhosus* from the feces during the search for carriers. He had been on kitchen police since December 18, 1918. On February 6th this man had a temperature of 100.2°. For three days following it was normal. On February 10th it was again 100.2° but normal for the succeeding five days. On the 16th it was 101.6° and on the 17th 99.6°. There was no fever after that. All subsequent laboratory examinations were negative except for the presence of diazo bodies in the urine on the seventeenth day. The typhoid complement fixation was positive but the agglutination titre of the serum was not high. Inoculated with U. S. triple typhoid vaccine October 15, 1917, and with French triple typhoid lipovaccine January 31, 1919. It is an open question if this was not a case of mild typhoid.

CASE II.—(20) Cook Battery E, 321 F. A. Admitted February 12, 1919 as a result of the isolation of *Bacillus typhosus* from the feces during the search for carriers. He was kept under observation for over a month during which time there were eight negative feces examinations. There was a positive complement fixation and the agglutination titre of the serum was moderately high. Inoculated with U. S. triple typhoid vaccine January 3, 1918, and with French triple typhoid lipovaccine January 31, 1919.

SUSPECTED CLINICAL CASES.

CASE I.—(21) Private, Battery E, 321 F. A. Admitted February 23, 1919, complaining of slight bronchitis, headache, pains in back and legs, weakness and poor appetite. Onset February 22, 1919. A palpable spleen was noted on the day after admission. Epistaxis occurred at the same time. Headache was complained of on the fourth and sixth days. The temperature ranged from 99° to 101° for seven days. The pulse averaged 80 and the respiration 20. There were no laboratory findings upon which could be based a positive diagnosis of typhoid fever. Four blood cultures, five fecal cultures and three urine cultures were negative. There was a positive complement fixation and only a moderately high agglutination titre for the serum. Inoculated with U. S. triple typhoid vaccine October 11, 1917 and with the French triple typhoid lipovaccine January 31, 1919.

CASE II.—(22) Private, Battery E, 321 F. A. Ad-

mitted February 26, 1919, complaining of slight bronchitis, chilly sensations, headache and meteorism. Onset recorded as February 24, 1919. On January 28th, 29th and 30th and February 5th, 6th and 7th this man reported at sick call with practically the same group of symptoms as those complained of on admission but there was no rise in temperature at any of these times. He had been on kitchen police since January 1, 1919. During the interval between January 28th and February 26th he performed full duty. He had a rise in temperature for four days as follows: February 26th, 100.5°, February 27th 99.6°, February 28th and March 1st, 101.6°. There were no other clinical symptoms of typhoid fever. Blood, feces and urine were negative bacteriologically. The diazo reaction was positive in the urine on the second day after admission. The complement fixation was positive and the agglutination titre of the serum was sufficiently high to be very significant. Inoculated with French triple typhoid lipovaccine January 31, 1919.

On the evening of January 26th a patient was admitted to Camp Hospital No. 10 from Battery E, 321st Field Artillery with a temperature of 100.6°, pulse of 90 and respiration of 16. He gave a history of acute generalized abdominal pain, which began on the previous day, but stated that he had been tired and had felt weak for three or four days. The admission diagnosis was acute appendicitis and he was immediately evacuated to Base Hospital No. 53 at Langres. The diagnosis was confirmed there and an appendectomy was performed that evening. The appendix was described as being postcecal with adhesions. It was acutely inflamed and had ruptured. There was free fluid in the abdominal cavity and pus in the right iliac fossa. For the first few days after the operation there was some abdominal distention, pain and vomiting, and the temperature remained around 102°, pulse 80 to 116, and respiration 20 to 24. In the patient there developed an apathetic state suggestive of typhoid but there were no rose spots, splenic enlargement nor diarrhea. The leucocyte count averaged 6,500 with forty per cent. lymphocytes. Blood, feces and urine cultures were made at the laboratory of Base Hospital No. 53 but were all negative for the *Bacillus typhosus* and *paratyphosus*. The temperature and general condition of the patient remained approximately the same until the fifth week, when the temperature dropped to normal by lysis.

During convalescence this patient admitted having drunk unchlorinated water at Rosoy. His service record was not available but he states that he had been inoculated six times before leaving the United States. It is probable that this was another case of typhoid and that it belonged to Group 1. This record was not available at the time that the cases were being studied at Camp Hospital No. 10, hence it was not included in the tabulations. The data concerning this case were placed at our disposal through the courtesy of Major C. E. S. Webster, M. C.

CLINICAL OBSERVATIONS.

Onset.—In approximately sixty per cent. of the cases the onset was gradual and more or less insidious. Four men (Nos. 12, 14, 15 and 18) were

hospitalized as a result of taking the temperatures of all of the men in Battery E daily. They would not otherwise have been discovered so early. One of these men (No. 15), however, had rose spots, a palpable spleen and a temperature of 102° on admission. Despite the fact that his temperature continued high he denied malaise until the eleventh day. Careful interrogation of the patients after their arrival at the hospital, for the purpose of ascertaining the earliest subjective symptoms elicited the information recorded in Table II, as follows:

TABLE III.

	No.	Percentage.
Headache	11	61
Fever	9	50
Malaise	7	39
Anorexia	7	39
Bronchitis	5	28
Constipation	4	22
Chilly sensations	4	22
Pains in back	4	22
Pains in legs	4	22
Generalized pains	4	22
Vomiting	2	11
Epistaxis	2	11
Abdominal discomfort	1	5.5
Diarrhea	1	5.5
Vertigo	0	0
Pain in right iliac fossa	0	0

When the epidemic originated the intervals between the onset and hospitalization were quite long. These intervals varied from three to twelve days in the first group. With the exception of one case (No. 15) the others were admitted before the sixth day. This was due, in large measure, to the search for febrile cases. It serves to emphasize the difficulty of early diagnosis of typhoid, in persons who have been inoculated, by attention to subjective symptoms alone. Several men, during the first few days of their illness, could not be convinced that they were sick enough to be kept in the hospital

DIAGNOSIS.

Fever was the most constant early objective symptom, all of the patients having some hyperpyrexia. It was extremely irregular, however, and to be appreciated required that it be taken and charted at frequent intervals.

Headache was a pretty constant early complaint (sixty-one per cent.) and was present at some time in sixty-six per cent. of the patients.

Bronchitis, though not especially prominent as an early complaint, was noted on physical examination before the third day in thirty-nine per cent. and at some period of the illness in sixty-six per cent. of the cases.

Anorexia was only noted as an early complaint in thirty-nine per cent. and in only forty-four per cent. of all cases during the illness.

Malaise was complained of early in thirty-nine per cent. but during the illness only fifty per cent. acknowledged that they had it.

Constipation was not prominent, being noted in only four cases.

Early diarrhea, persisting from the second to the seventeenth day was present in one case. Another man had diarrhea from the third to the fifth day and one had it for four days in the fourth week. As an early symptom of diagnostic value, therefore, it was noted only once in this series.

Pains in back, pains in legs, and generalized pains were each noted four times but abdominal pain was infrequent, never prominent as a nearly symptom,

and only severe in two cases, one of which perforated. Right iliac pain was never noted.

Epistaxis was present twice in the first week and twice in the second (twenty-two per cent.) of the cases.

Vomiting occurred three times in the first week and whereas it occurred in three other cases in the third or fourth week, it was never persistent or troublesome. Total incidence thirty-three per cent.

Among the objective findings rose spots were the most constant, being present in fifteen cases (eighty-three per cent.); six times in the first week; four times in the second; three times in the third; once in the fourth; and once in the fifth.

A palpable spleen was recorded twelve times (sixty-six per cent.); three times in the first week; five times in the second; three times in the third; and once in the fifth.

Meteorism was noted five times (twenty-eight per cent.) in the first week and at some period of the illness ten times (fifty-six per cent.)

Delirium occurred but once before the fourth week. Four patients (twenty-two per cent.) were delirious at some time.

Jaundice was present only in one case.

COMPLICATIONS.

Bronchopneumonia was noted clinically four times (Nos. 1, 3, 4, 15), and was discovered at autopsy in two other cases. It was not present until the third week. Lobar pneumonia was diagnosed once clinically and was confirmed by autopsy.

Intestinal hemorrhage occurred in three cases (Nos. 1, 5, 12). It caused complete exsanguination and was the immediate cause of death in one case (No. 5). In the other two cases the intestinal hemorrhage was not in itself, the cause of death. It was a contributing factor in No. 1 and incidental in No. 12, death being due in the latter, to perforation followed by general peritonitis.

Nephritis was present in two cases (Nos. 1 and 16). In the former it was a contributing factor in producing death but the latter case recovered. It is worthy of notice that the *Bacillus typhosus* was only isolated from the urine of this one case (No. 16).

Phlebitis of the left leg occurred in one case (No. 13), acute catarrhal otitis media once (No. 8) and perforation once (No. 12).

RELAPSES.

In only two cases was the clinical course suggestive of a relapse. In No. 7 the temperature ranged from 102° to 104.6° for six days, then fell by lysis reaching normal on the eleventh day after admission. After remaining normal for twenty-four hours it gradually ascended to 104° and ranged between that point and 101° for twelve days, when it fell to normal by crisis. In case No. 16 the temperature was 104° on admission. It gradually fell by lysis, reaching normal the fifth day after admission. It remained normal for twenty-four hours, then ranged from normal to 99.6° for three days, then rose to 102.4°. It remained between 102° and 103° for five days and then fell by lysis, again reaching normal on the twenty-second day after admission.

DURATION.

The shortest duration was eleven days, the longest forty-seven days, and the average twenty-nine days.

TERMINATION.

Death terminated six cases. Five of the deaths occurred in the first group of seven cases, which, there is reason to believe, received the most massive infections. Three of the patients were hospitalized in the first week, two in the second, and one in the third. There were twelve recoveries; one by crisis, two by rapid lysis, and nine by the usual lysis.

PATHOLOGICAL ANATOMY.

An opportunity was afforded to study the gross pathology in six cases and several features were noted that deserve attention because of the possible relationship between antityphoid inoculation and the pathological anatomy that was observed.

Intestinal lesions.—In every case that was autopsied there were, in the upper intestines, lesions having the typical shaven beard appearance of healed typhoid ulcers. These lesions extended rather high in the duodenum, in two cases being noted within six inches of the pyloric opening of the stomach. One case showed a very acute duodenitis of the upper twelve inches of the duodenum. The mucous surface of the gut was roughly granular due to the hyperplasia of the lymphatic tissue in the submucosa. There was an intense congestion of the blood vessels of the mucosa and submucosa giving to the gut, a bright red color. With regularity the lesions became more extensive and severe as one proceeded with the examination of the intestines from the upper to the lower portions. First one would encounter in the lower duodenum or upper jejunum sometimes right at the side of a healed lesion, a round or oval swollen avascular lymphatic patch; then an acutely inflamed, bright red, swollen patch; then a similar patch with a small central excavation; and then still lower down, usually in the lower ileum or ileocecal region, the typical large, deep, round or oval ulcerations, extending through the mucosa, submucosa and musculature. The ulcerations extended into the colon in three instances; once in the ascending; once in the ascending and transverse; and once in the ascending, transverse and descending. In one case (No. 2) the intestinal lesions were all either healed or rapidly healing. Death was due to an intercurrent lobar pneumonia.

Pancreas.—The pancreas, in every case that was autopsied was very firm and grossly suggestive of an interstitial pancreatitis. Microscopically those examined showed a cellular infiltration and fibrous tissue proliferation between the glandular acini and in the interlobular tissue. This indicates that the infection extended from the duodenum up through the pancreatic ducts, causing diffuse interstitial pancreatitis.

Gallbladder.—There was an acute catarrhal cholecystitis in five of the six cases.

Spleen and mesenteric lymphatics.—In no case was there more than moderate hyperplasia of the spleen, and the hyperplasia of the mesenteric lymph glands with the accompanying distension of the lymph channels seemed to parallel the splenic hyperplasia.

Kidneys.—Acute focal glomerulitis was noted once (No. 1). In no other case was there more than a moderate cloudy swelling of the kidneys.

Lungs.—Lobar pneumonia was present once (No. 2), very late terminal bronchopneumonia twice (Nos. 1 and 12), a generalized lobular pneumonia three times (Nos. 3, 4 and 5). Healed or chronic inactive pulmonary tuberculosis was noted in three cases (Nos. 4, 5 and 12).

CAUSES OF DEATH.

The immediate causes of death were as follows:

Lobular pneumonia, two cases; terminal bronchopneumonia and focal nephritis, one case; lobar pneumonia, one case; fatal hemorrhage, one case; perforation, one case.

LABORATORY EXAMINATIONS.

Technic.—Blood cultures were made by placing two to three c. c. of blood after puncture of the median basilic vein into fifteen c. c. of bile medium contained in a test tube. The use of small amounts was necessitated for the conservation of materials. These were incubated for eighteen to twenty-four hours and examined for the presence of typhoidlike organisms. Final identification was made by subcultures on endo medium, Russell's triple sugar and agglutination with diagnostic sera prepared at the Central Medical Laboratory, Dijon, France. Subcultures of all of the strains isolated were sent to the central laboratory for complete biological and immunological study.

Feces cultures were made by taking swabs directly from the stools and sending them to the laboratory in sterile test tubes. Fifteen c. c. of ordinary peptone broth medium was inoculated from the swabs and after standing for two hours at room temperature a drop of this broth was transferred to an end plate and smeared with a metal rod. A second end plate was made from the first. Subsequent subcultures were made as for blood. Urine was obtained in sterile test tubes and was added in the proportion of one to three to peptone broth and incubated eighteen to twenty-four hours. Examination was then made for organisms of the typhoid group. If present subcultures were made upon end medium and then regular routine. All original cultures from blood, feces and urine were incubated and subcultured for five successive days before the rendition of negative reports.

Agglutination reactions were done by a slightly modified Dreyer technic. The diagnostic sera were obtained from the central laboratory and the same sera were employed throughout. The following is the history of the diagnostic sera: Paratyphoid A (C. M. D. L. 399), prepared from culture of *Bacillus paratyphosus* A (New York Health Department strain 228 as antigen); paratyphoid B (C. M. D. L. 78), prepared from culture of *Bacillus paratyphosus* B (New York Health Department strain 225 as antigen). Typhoid (C. M. D. L. 429), prepared from culture of *Bacillus typhosus* (Mt. Sinai Hospital, New York city, strain 1 as antigen). The bacterial emulsions employed for the Widal reactions were obtained from the central medical department laboratory. The same batch of emulsions was used for all of the reactions.

The following is the history of the bacterial emulsions: Paratyphosus A prepared from New York Health Department strain 228; paratyphosus B prepared from New York Health Department strain 225. Typhosus prepared from Central Medical Department Laboratory strain 11, a Rawlings strain from the U. S. Army Medical School.

RESULTS.

The diagnosis of typhoid fever were confirmed by positive laboratory findings in seventeen of the eighteen clinical cases, ninety-four and one half per cent.

Blood.—Positive blood cultures were obtained in fourteen cases, seventy-eight per cent. The following data applies to the four cases in which positive blood cultures were not obtained: (No. 6) Admitted on the eleventh day of illness. The first blood culture was taken on the twenty-fourth day. The typhoid course was mild. (No. 11) Admitted on the third day of the illness. The original diagnosis was influenza but was changed to typhoid fever on the thirteenth day, after the isolation of typhoid bacilli from the feces. No blood culture was made. (No. 14) Admitted to the hospital on the third day of the illness. First blood culture was taken on the tenth day. No other confirmatory laboratory findings except a positive complement fixation. (No. 18) Admitted on the fifth day as a carrier after the isolation of typhoid bacilli from the feces. First blood culture made on the tenth day.

The earliest positive blood culture was obtained on the fifth day and the latest on the forty-third day. The diagnosis was first confirmed by blood cultures in nine cases, fifty per cent.

Feces.—Positive feces cultures were obtained in eleven cases, sixty-one per cent., the earliest on the second day and the latest on the twenty-ninth day. The diagnosis was first confirmed by the feces examination in seven cases, thirty-nine per cent.

Urine.—A positive urine culture was obtained from but one case, No. 16. The urinary findings gave evidence of nephritis on the third day of the illness. The diazo reaction was not significant enough to attach much importance to it. It was positive in two clinical cases, No. 12 and No. 15, on the twenty-fifth and sixteenth days respectively, in one carrier, No. 19, on the seventeenth day and in one suspected case, No. 22, on the third day.

Blood counts.—The lowest total leucocyte count was 4,200 on the twenty-seventh day and the highest was 10,800 on the fortieth day. Normal counts were the rule. The lymphocytes averaged thirty-seven per cent. The leucopenia ordinarily expected in typhoid cases was notable by its absence.

Complement fixation.—The complement fixation was positive in all of the cases.

Widal reactions.—Seven of the cases showed an increase of the agglutinin content of the sera from nine to over 4,500 units. No agglutination reactions were done on the sera of four cases and in four others but one estimation was made of the agglutinins. In one case the agglutinins remained constant and two cases showed a diminution after the first titration, indicating that the peak of the curve, or maximum agglutinin response had been reached and that the titration was again falling. The low-

est agglutinin content was nine units and the highest 9,000. The bacterial emulsions employed for the Widal reactions were standardized to a Dreyer emulsion, hence the tabulated results represent standard agglutinin units.

Had it not been our good fortune to obtain bacteriological confirmation of the clinical diagnoses in so large a proportion of the cases the agglutination reactions would have been of incalculable diagnostic value, and would have confirmed the clinical diagnoses in over fifty per cent. of the cases. The last five cases of clinical typhoid admitted to the hospital and the two carriers had been reinoculated with triple typhoid lipovaccine (French) on January 31, 1919, and this had to be considered in attaching importance to the agglutinin content of the sera. By comparing the results in these cases with two other series, one a group of men one month after inoculation with the same vaccine and the other a group who had not been recently inoculated, it will be seen that the relative values were as significant as in the other cases.

In its biological characteristics the strain of *Bacillus typhosus* isolated from this epidemic is not identical with the strain which is employed for the U. S. Army vaccine, differing in its fermentation reaction with xylose. From an immunological viewpoint this is of importance as it suggests these queries:

1. Are all strains of the *Bacillus typhosus*, which fulfill all of the requirements for an immunizing antigen equally efficient for protective inoculation?

2. Is a given strain, which fulfills all the requirements for an immunizing antigen, as efficient in producing immunity against another strain with slightly different biological characteristics, as an immunizing antigen homologous to the latter strain?

3. Should not the ideal immunizing antigen contain all strains that differ in their biological reactions? The immunological aspects of this problem will probably be the subject of later publications from the Army Medical School as it is now under extensive investigation.

CONCLUSIONS.

1. The probable source of this epidemic was polluted water.

2. It was further transmitted by carriers among food handlers.

3. The early diagnosis of typhoid fever among inoculated persons requires more attention to the objective than to the subjective symptoms.

4. Fever may be the only early objective symptom and may be present when no subjective symptoms are complained of.

5. Headache was the most constant early subjective symptom of this series of cases.

6. Malaise, anorexia and diarrhea were not prominent among the early symptoms in this series.

7. Antityphoid inoculation will not protect individuals against the ingestion of massive doses of typhoid bacilli.

8. The gross pathological anatomy of typhoid fever in inoculated persons shows some differences from that ordinarily observed. The intestinal lesions show evidence of a vigorous fight on the

part of the natural defenses of the body before succumbing to the infection. The extreme splenic hyperplasia ordinarily observed does not occur. Our experiences indicate that interstitial pancreatitis is a common result of typhoid infection in inoculated persons.

CHRONIC PERITONSILLAR ABSCESS.

By MAXWELL QUACKENBOS, M. D., M. R. C. S.
(Eng.)

New York.

The etiology of this comparatively rare lesion is obscure. Those textbooks which mention the condition voice the opinion that chronic peritonsillar abscess if encysted may be tuberculous in origin but attribute the malady most frequently to a caseous crypt of the tonsil. In many instances the abscess must be entirely overlooked, as for example when the operation of enucleation is performed by the digital method or the operative field concealed by hemorrhage with the swallowing reflex present. I do not see how the small pocket of pus can be possibly recognized and the diagnosis confirmed unless the deeply anesthetized supine patient's tonsils are enucleated by some dissection method as that of Waugh's technic, in which procedure a sandbag is placed under the shoulders and the head hyperextended so that the point of the chin, the neck and the chest are in a straight line. With the tongue drawn out by a suture through its dorsum and the chin held forward, this position gives an unobstructed view, a free air way and converts the nasopharynx into a dependent reservoir; no blood will then enter the larynx. In the six cases of chronic peritonsillar abscess herewith recorded the age incidence was between twelve and twenty-six years, four being female patients, three of whom gave history and showed evidence of tonsillotomy many months previously. All patients had suffered from the prevailing endemic of influenza. The symptom presented by the patients was the usual debility and its attendant secondary anemia. Two of the younger patients had superimposed renal symptoms of albuminuria. There was no history of throat trouble and no acute stage of inflammation. Enucleation of the small embedded tonsils was advised because of the palpable enlargement of the afferent cervical (tonsil) lymph node. The diagnosis of chronic peritonsillar abscess is dependent upon the observation of grayish pus of thick consistency in its cavity situation under the capsule in the region of the supratonsillar fossa. The largest abscess was the size of a split pea and all were located on the left side. The condition might be aptly described as an encysted abscess although the patients were not tuberculous. The abscess was not due to a crypt of the tonsil. There is no anatomical foundation for the belief that it arose as an adenitis of a lymph node in that region. I am of the opinion that this focal septic lesion is a sequella of constitutional infection (as empyema or an epiphysitis probably as a result of a bacterial embolus. Following enucleation the patient's condition rapidly returned to normal.

175 WEST FIFTY-EIGHTH STREET.

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PHYSICIAN AND AUTHOR.

What has been described as "the most baffling bit of literature ever set down on paper" was written by Dr. Francois Rabelais—old Dr. Rabelais—upon whose head has been heaped more anathema than upon the head of any other writer. Those who are displeased with his coarse language and smutty yarns call him a filthy old blackguard, and will have none of him. On the other hand, Dr. Rabelais has his host of tolerant admirers throughout the world, and he has long been rated as a classic. The French have raised him to a pinnacle of fame, and unquestionably he was a humorist of the first rank, the father of ridicule, and merciless in flaying the customs of courts and convents, of schools and camps, of processes and wars, of romances and legends. The influence of Rabelais upon English literature has been greater than many persons would willingly admit; but the fact is that numerous authors studied and imitated him, as their work amply testifies. A shoal of minor humorists, poets and essayists have pillaged right and left from the stores of wit and humor in his *Gargantua and Pantagruel*, and English novelists have availed themselves of all sorts of plots and episodes from the same prolific source.

Rabelais was born about the year 1483 at Chinon, an ancient little town in the province of Touraine, France. The details of his life are enshrouded in uncertainty, but it is fairly definitely established that he spent at least twenty-five years in the cloister, first as a Franciscan monk, later as a Bene-

dictine, and finally gave up the cloistered life to enter Montpellier University, where he took all his degrees as a physician and gained a considerable reputation as a practitioner. During this practice he began writing medical tracts, and translated the Aphorisms of Hippocrates and some of the works of Galen, published first in 1532 by the famous Gryphius, of Lyons, and reprinted many times.

There is no clear record of how Rabelais came to leave Montpellier, but the supposition is that he probably was sent by the university to Paris to intercede for it at court, and was invited to remain at the capital, for he was a delightful fellow to have around. The generally accepted version is that, due to some mischievous pranks on the part of students, the university had been deprived of some of its privileges, and Rabelais so effectually pleaded the cause of the school that the chancellor immediately restored the privileges. Thus it is that, in gratefulness to the incorrigible old doctor, no one today is admitted to the degree of M. D. at Montpellier who has not first put on the cap and gown of Rabelais, which are preserved in the castle of Morac in that city.

Rabelais did not end his days as a physician. John, Cardinal du Bellay, Bishop of Paris, who had been Rabelais' friend from boyhood, employed him in a diplomatic position. It was at this period, some say, that he composed his *Gargantua and Pantagruel*. It seems to be fairly well established, however, that in addition to his practice as a physician at Montpellier he also served two years at Metz as the town physician, at the princely salary of one hundred and twenty livres a year. A livre was about twenty cents. And he also was physician for a time to the Hotel Dieu at Lyons, at the still lesser compensation of forty livres. They were generous to their physicians in those old days.

Rabelais' *Gargantua and Pantagruel* has been described as "a vast ocean of pure and impure tomfoolery and laughter surrounding a few solid islands of sense and reason and devotion." The greater part of these books is burlesque romance into which was introduced a vein of buffoonery quite in accordance with the spirit of the age. In it he delighted to make merry with the impertinences of mankind, and nothing was able to allay his mirth. It is wholly on this satirical work that the fame of Rabelais rests. His Latin versions of Hippocrates' Aphorisms and Galen are much esteemed also for their faithfulness and purity of style; but their circle of readers is small.

He also wrote several French and Latin epistles in excellent style to numerous great and learned men, and he wrote a book called *Sciomachia*, printed in Lyons in 1549. An Almanak for the year 1553, calculated by him for the meridian of Lyons, shows that he was an astronomer of great ability. Dr. Rabelais was also a poet, philosopher, grammarian and theologian, and a great linguist, skilled in French, German, Italian, Spanish, Greek and the Hebrew tongues, and his letters prove that he also understood Arabic, which he learned at Rome.

Rabelais died in a house in the street called La Rue des Jardins, in St. Paul's parish at Paris, about the year 1553, aged seventy years. But his fame will never die. The best pens of his age honored his memory with epitaphs, and since that time his name has appeared times without number in the literature of all lands. As he lived, so he died, jesting. Just before his demise he wrote a will, which, when opened, is said to have contained these three articles: "I owe much, I have nothing. I give the rest to the poor."

HOURS OF WORK AND HEALTH.

The relation of hours of work to fatigue concerns the preservers of health; the relation of hours of work to production concerns the managers of industry. Thus far most of the latter have gone ahead on the theory that the more hours the more production, without any great thought as to the effect on the individual workman. Now and then it was bruited abroad that such a policy involved an immense waste of human material, but this did not worry many people except those who were being wasted. Then the war came with its need for intensified production, leading to an unparalleled publicity campaign for physical fitness. Even workmen were included, for the truth came out that people cannot work too long and too hard without suffering.

England was one of the first countries to conduct scientific investigations into the question of fatigue and hours of work. England tried to speed up her munition workers until she discovered that they were breaking under the strain; then studies of the munition industry were made, with the result that hours of work were shortened and both the health and effectiveness of the workers were increased. Now comes our own Public Health Service with a report (*Public Health Bulletin* No. 106, *Studies in Industrial Physiology*) proving the superiority of the eight over the ten hour day. The findings are based on a comparison of an eight and a ten hour plant, each a huge industrial establish-

ment prominent in the metal working industry. Superiority of the eight hour day was proved from the economic standpoint—that is, in respect to maintenance of output, lost time, and labor turnover. But the eight hour day was also proved more beneficial to the workman and this in a way that the employer could appreciate because it touched his pocketbook—it was found to reduce the rate of industrial accidents.

Ordinarily accidents may be expected to vary directly with speed of production, owing to increased exposure to risk, but when fatigue is taken into consideration there is a marked modification of this rule. When there is a reduction of output due to fatigue there is a rise in the number of accidents; that is, in the last hours of the ten or twelve hour day, in spite of employees slowing up in work, more accidents occur. If for any reason production is speeded up in the last hours, when the laborers are fatigued, the number of accidents rises so rapidly as to leave no room to doubt that the higher accident risk accompanies the decline in working capacity of the employee. In general, the plant exhibiting the indications of heavier fatigue in output is also the plant subject to the higher accident risk.

Where does all this investigating lead? A few forward looking employers have been able to see for themselves that sodden drudges are not as desirable as workers who have leisure for recreation, for study, for health; organized labor is bringing the recalcitrant into line. But the duty of the scientist is clear. "To humanize working conditions, to reassert the value of the individual, to study all ways of releasing in work the best energies of the worker, instead of as now so prodigally wasting them, this should be the practical rôle of science in industry. And it is as a contribution to this new era of intensive study devoted to large ends that this report has been aimed."

TREATMENT OF TETANUS.

Castaigne and Paillard have recently given some complete and up to date data concerning tetanus when the disease has declared itself, and their remarks on the treatment are well worth considering. They point out that there are a certain number of conditions present which should guide the treatment when the disease has been confirmed. For instance, the subject has a wound which requires surgical care; he suffers from painful permanent contraction, to which intermittent paroxysms are added; a specific intoxication exists, as well as inanition and dehydration.

The first step in the treatment is the adminis-

tration of sedatives, keeping the patient absolutely quiet, preferably in a darkened room, and the avoidance of all unnecessary examinations. Hot baths (101° to 104° F.), lasting from half an hour to forty minutes and repeated every three or four hours, will lessen the contracture and result ultimately in a very pleasant sedation and occasionally sleep, which should be carefully guarded. The patient should be moved from place to place with the utmost care.

Of sedative medicines, chloral is recommended administered in doses varying from six to ten, or even fifteen grams, either in combination or not with four to eight grams of potassium iodide, by mouth or rectum. Chemically pure neutral sodium persulphate, preserved in closed ampoules, should be given intravenously in doses of five grams in one hundred cubic centimetres of sterile distilled water. Intraspinal injections of magnesium sulphate in a twenty-five per cent. solution—one cubic centimetre for every twenty kilograms of body weight—may be given once a day, or it may be given subcutaneously, in which case ten cubic centimetres of the twenty-five per cent. solution are given four times daily.

Morphine and chloroform are not so highly recommended, but the latter, when inhaled in small quantities, will relieve the pain of hyperacute tetanus.

The second aim of treatment is specific medication and its basis is serotherapy. Regardless of the lack of irrefutable proof, Castaigne and Paillard believe that clinical experience is decidedly in favor of this form of treatment. In the acute and subacute forms of tetanus a daily injection of twenty to thirty cubic centimetres of serum should be given during the first week, after which one every two or three days will suffice. The injection may be given subcutaneously or in the epidural space, but the latter route does not seem to offer any advantages over the former. Baccelli's method, which consists of forty centigrams to one gram of carbolic acid dissolved in oil or glycerin, according to the gravity of the infection and the patient's weight, is still a moot subject, but it can be resorted to in combination with other therapeutic measures. The injections should be given daily during the first week and afterward every second or third day.

Feeding is a most important factor in the treatment of tetanus, on account of the inanition and dehydration of these patients. Feeding by mouth is often impossible, or at best difficult, on account of the trismus and dysphagia, so that rectal feeding must be resorted to. Rehydration is obtained by the same route. Two rectal feedings and two

glucose serum rectal injections are to be given in twenty-four hours. One cleansing enema will be required daily. Glucose serum or salt solution can also be administered subcutaneously. The latter will be the ultimate resource when dysphagia exists and rectal intolerance is present. Lastly, accessory medicaments, such as camphorated oil as a tonic—one to three grams of camphor in twenty-four hours, subcutaneously, sparteine for the heart, and subcutaneous injections of oxygen, when contracture of the inspiratory muscles exists, must never be overlooked.

EDITORIAL ANNOUNCEMENT.

Beginning with this issue we shall publish a series of editorials about medical men in literature. Strange as it may seem, some of the greatest men in the literary world were physicians. Many of them were Americans. Rabelais will be the first physician author described, others will follow. A great deal of research was necessary to complete this work, which has been done by Jefferson Williamson especially for the *NEW YORK MEDICAL JOURNAL*.

These editorials will be intensely interesting. It will be well worth your while to read the entire series.

News Items.

Tampico Quarantined.—Quarantine against bubonic plague has been established in Tampico, Mexico.

Addition to Rockaway Hospital.—Plans are under way to erect a Soldiers' and Sailors' Building as an adjunct to the Rockaway Beach Hospital, in memory of Rockaway boys who served during the war.

Dr. William O. Pitt to Red Cross League.—Dr. William O. Pitt has been appointed chief of the Department of Child Welfare of the League of Red Cross Societies. He has been active in child welfare work in England since 1910.

War Invalids in Government Hospitals.—The Bureau of War Risk Insurance is embarking on a plan to concentrate convalescent veterans in hospitals owned and controlled by the Government. There are 17,981 disabled exservice men and women being cared for in more than 1,000 hospitals scattered throughout the United States, of this number 8,123 are in Government hospitals and 9,858 in private or state and county hospitals and sanatoria.

Radium Soon Available.—On and after October 15th, the New York State Institute for the Study of Malignant Diseases, in Buffalo, will administer the two and one quarter grams of radium which the state legislature recently enabled it to purchase by an appropriation of \$225,000. Any citizen of the United States will be treated free of charge at Buffalo, but preference will be given to residents of New York State. Dr. Harvey R. Gaylord is director of the Institute.

Award to Dr. Pende.—The Balbi-Valier prize offered by the Venice Reale Istituto has been awarded to Dr. Nicola Pende, professor of pathology in the University of Palermo, for his works on the organs of internal secretions.

Honorary Degrees.—Cambridge University has conferred the honorary degree of Doctor of Laws upon Dr. John Jacob Abel, professor of pharmacology at Johns Hopkins Medical School, and Dr. Harvey Cushing, professor of surgery at Harvard Medical School.

Maryland Health Department Enlarged.—A department of bacteriology has been established by the Maryland State Board of Health, under the direction of Dr. R. C. Salter, and a new venereal disease department under the direction of Dr. Walter Brunet.

Woman Physician Decorated.—Dr. Blanche Norton, of Eldon, Iowa, has been awarded the Order of King George I by King Alexander of Greece. Dr. Norton, a physician of the American Committee for Relief in the Near East, distinguished herself at Kerrassunde, Anatolia, by treating Greek orphans with trachoma. She contracted the disease herself but has since recovered.

Florida State Medical Association.—The Florida State Medical Association met May 12th and 13th at Daytona and elected the following officers: President, Dr. William E. Ross, of Jacksonville; vice-presidents, Dr. Clyde C. Bohannon, of Daytona; Dr. George A. Davis, of DeLand; Dr. James H. Fellows, of Pensacola; secretary-treasurer, Dr. Graham E. Henson, of Jacksonville. Pensacola was selected as the next place of meeting.

Municipal Milk.—The city council of Manchester, England, has voted to municipalize the distribution of milk.

The health committee's arguments in support of the proposal were that as supplied at present Manchester milk would all be classed C3 according to American grading, and would be allowed for use only for cooking and for manufacturing purposes; that impure milk was largely responsible for tuberculosis in children, and that one third of the deaths of children under five years of age could be attributed to bovine infection. Adulteration was so common that Manchester citizens paid £35,000 yearly for water.

Tuberculosis Research Fellowship.—To encourage study of the means for the prevention and cure of tuberculosis, the Hennepin County Tuberculosis Association of Minneapolis, has set aside a fund for the support of a tuberculosis research fellowship in the graduate school of the University of Minnesota. The candidate for the fellowship must be a graduate of a Class A medical college. He will be expected to devote himself to research in some problem concerned with the causes, prevention or cure of tuberculosis. No teaching or other service will be required. The fellowship yields \$750 the first year and progressively increasing amounts to be appropriated for the second and third years as conditions warrant.

Inquiries and requests for application blanks should be addressed to the dean of the graduate college, University of Minnesota, Minneapolis.

Dr. Villard Elected to Faculty of Lyon.—Dr. Villard, surgeon to the Hotel-Dieu and an editor of the *Lyon medical*, has been named professor of operative medicine at the University of Lyon, to succeed Prof. Maurice Pollosson, resigned.

International Health Journal.—The *International Journal of Public Health*, which makes its first appearance with the July number, is the official scientific organ of the League of Red Cross Societies. Dr. Thomas R. Brown is the editor, Dr. W. W. Francis is the associate editor, and the assistant editors are Miss Harriet Bailey, Mr. Marshall Balfour, Dr. Garcia Banus, Mr. Walter Clarke, Dr. E. F. Ducasse, and Dr. Lina M. Potter. The *Journal* will be published every two months and will appear in four editions, English, French, Italian and Spanish. It will be devoted to all phases of public health and preventive medicine.

New Medical Journal in Palestine.—Palestine's first medical journal, a quarterly entitled *Harcfoosh* (Medicine), has just made its appearance, published by the Jewish Medical Association of Palestine. Medical work in Palestine has been greatly stimulated during the past two years by the physicians and nurses with the American Zionist Medical Unit, who have taught the native members of the profession modern methods. The hospitals and clinics established by the American unit in Palestine are planned as the beginning of the Medical College of the Hebrew University at Jerusalem.

Hookworm and Tuberculosis.—Information with regard to mistaken diagnosis in the case of tuberculosis and hookworm is contained in a preliminary report received by the War Department on a study conducted by army medical men at General Hospital No. 19, at Oteen, N. C., where tuberculous patients are treated. The report says that many cases which had been diagnosed as tuberculosis on further examination showed signs of hookworm, and under treatment for hookworm the patient improved greatly. Accurate figures as to the number of hookworm cases which had shown all the evidences of tuberculosis will soon be compiled. It is estimated that about ten per cent. of the patients suffer from hookworm at the time of admission and that about two per cent. do not have tuberculosis.

Died.

BAKER.—In Dennison, Ohio, on Sunday, August 1st, Dr. Charles Wesley Baker, of Kilgore, aged forty-seven years.

CONCANNON.—In New York, N. Y., on Sunday, August 1st, Dr. James J. Concannon, aged sixty-four years.

CROWLEY.—In Potsdam, N. Y., on Sunday, July 25th, Dr. William H. Crowley, of Chicago, aged fifty-three years.

HARDING.—In Topeka, Kan., on Tuesday, July 27th, Dr. Eva Harding, aged sixty-three years.

HUGHES.—In Boston, Mass., on Friday, July 30th, Dr. Laura Ann Cleophas Hughes, aged sixty years.

JONES.—In St. Louis, Mo., on Tuesday, July 27th, Major D. C. Jones, of Leavenworth, Kan., aged eighty-two years.

KENNY.—In New York, N. Y., on Saturday, July 24th, Dr. John Joseph Kenny, aged thirty-seven years.

PARKER.—In Southampton, Pa., on Saturday, July 24th, Dr. George Albertson Parker, aged sixty-six years.

QUINT.—In Boston, Mass., on Monday, July 26th, Dr. Norman Perkins Quint, of West Medway.

Book Reviews

FRIEDRICH HEBBEL

Friedrich Hebbel. Ein psychoanalytischer Versuch. By Dr. J. SADGER, *Schriften zur angewandten Seelenkunde.* Edited by Prof. Dr. SIGMUND FREUD. No. 18. Vienna: Franz Deuticke, 1920. Pp. 374.

"My purpose is to write an entirely sincere book—the reader will judge if I have succeeded—that is, to draw the man Friedrich Hebbel as he appears to me, not merely in his merits and his great accomplishments but also with all his many weaknesses. This will be seen not to be due to a lack of appreciation of the genius which has given the world such great, such immortal gifts. It seems to me that genius is little served when one pours out only psalms of praise, for it is only to the gods that incense is not a poison; it befogs and stupefies earth-bound man, veiling the truth. And to find the truth, with favor to no one, but also with injury to no one, seems to me the first task of the investigator."

This latest volume in the psychoanalytical series of the *Schriften zur angewandten Seelenkunde* is thus introduced by the author. This author has written earlier (*Von der Pathographic zur Psychographic. Imago* Vol. 1, No. 2, p. 158) explaining the difference between such scientifically psychological search for truth through understanding of a human life and its work and that of the blind and pointless method of applying a certain amount of superficial psychological skill to the study of a writer and exercising perhaps a prurient delight in destroying the world's idols. The sincere purpose of the author and the thoroughly openminded and faithful manner in which he has carried it to fulfillment show how far genuine psychoanalytical study stands above a superficial dabbling with human lives or human achievements. If one reads again thoughtfully the words quoted above from the author's preface, one will find full justification for presenting this study even to a group of readers outside Hebbel's own country and where his works are comparatively little known. This justification is made more complete by an examination of the contents of the book.

In the first place, the author's point of view shows us the value that such a study of any life may have. For the reader finds here what is promised, a study of the characteristics of a man, the strong and the weak, and of his performances in the light of his entire life, with particular emphasis upon his childhood. In this way the contradictions of his personal life, the power of his creative work, as well as its limitations, become comprehensible. To submit any life, its character and its products, to such careful and penetrating scrutiny yields rich results for enlarging psychoanalytical knowledge. Such is the case with this book. So keen and faithful is the search for underlying psychic facts and the portrayal of these as discovered, the discussion of the elements of environment which play upon a life and, more important still, the reactions of such a life to these environmental factors, that the reader is compelled also to a persistent probing and analysis of self throughout the reading.

The subject of this book affords, moreover, specially rich material for such investigation, material which is peculiarly fitted to bring home these searching and therefore wholesome truths. Hebbel is a poet who attracts psychoanalytical study. In the first place, he himself has given much information concerning his own inner life and the feelings and experiences of his childhood in his reminiscences and his diaries. Moreover, in doing so he has revealed, just as he has in all his creative writing, an acknowledged belief in the unconscious with its storehouse of creative impulses and its reserve material of phantasies. Along with this he reveals a striking appreciation of the dream, of its close relation to artistic creation, and of its function in the life of the dreamer. Besides, the creative works of the poet reveal the close relation of these to his own unconscious content, the limitations and imperfections of this poetry revealing the infantile complexes which to a large extent always dominated him.

These are plainly traceable, largely through the testimony he himself has given, to the infantile period of his life and to the sexual difficulties which there built themselves around both parents and around other objects of his environment. These were not necessarily directly sexual in the adult sense of the word but richly illustrative of the infantile sexuality which it has been discovered played such an enormously important part in determining his later life and production. The writings of the poet testify to the power bound with these complexes which in part found sublimation into works of force and strength, serving thus to discharge in really great form these infantile libido trends and thus furnish release for the poet and for his audiences. At the same time they, too, largely filled his plots and their developments and therefore, because of their often too insistent and too grossly exaggerated infantile character, they failed to establish the hold upon the world that they otherwise might have had. In his personal life they played a still more disturbing part. The man Hebbel was governed too strongly, too compulsively, by these factors to fulfill his part as lover, husband, father, friend, in the best way. His inability to free himself from the infantile bondage to either parent seriously marred his relations with his fellow beings and brought suffering to many in his train.

The details of his character and of its development from its early determinants are largely those of the compulsive neurotic. The elements of his partial success, great and imposing as far as it was attained, as well as his weaknesses and failures, serve to throw much light upon the makeup of such a neurosis, the difficulties with which such a character must contend, its manner of meeting these difficulties in overcoming or succumbing to them, and upon the infantile experience out of which such a form of character arises. Therefore the study of a man who reveals in such large measure the elements of both greatness and weakness, bound together in such a condition, is an invaluable human document. Added to these revelations of human character, of

the striving of human elements which speak through his writings, is his definite teaching regarding psychic material and the mechanisms, such as the dream, through which it reveals itself. English readers must acknowledge, therefore, beyond the general psychoanalytical debt to Sadger, their indebtedness to him for the opportunity to become better acquainted with this poet of the unconscious of another land and tongue.

OPHTHALMOLOGY.

A Practical Treatise on Ophthalmology. By L. WEBSTER Fox, M. D., LL. D., Professor of Ophthalmology, Medico-Chirurgical College Graduate School; University of Pennsylvania, etc. Illustrated. New York: D. Appleton & Co., 1920. Pp. i-831.

This new edition of Fox's follows the older edition fairly well. The new technic which the author devised for the relief of conical ulcer has been added to the original test. The author's experience with this operation causes him to recommend it highly. His description is given in detail and can be followed with ease. He also describes an operation of great simplicity which he uses for the excision of the tarsal cartilage in trachoma. He has described the Elliot operation for glaucoma with the Fox modifications for comparison. Some space has been given to the use of biological tests in diagnosis and treatment. This is important and carefully worked out and should prove of great interest. Much work has been done in this field experimentally and it is encouraging to find it incorporated in a textbook with the merits of this one.

HUMAN COSTS OF WAR.

The Human Costs of the War. By HOMER FOLKS. Organizer and Director of the Department of Civil Affairs of the American Red Cross in France and Later Special Commissioner to Southeastern Europe. Illustrated with photographs by Lewis W. Hine. American Red Cross Special Survey Mission. New York and London: Harper & Brothers. Pp. i-326.

Homer Folks is qualified to write about the *Human Costs of the War*. After all there are only two things to consider: The human costs and the effect of the war on human progress. If those who say they are so weary of war stories would spend the same amount of energy in decrying war, wars would be at an end. But it seems consistent with human folly to refuse to face the products of our own making, so that we may be able to repeat our crimes with a clear conscience.

This survey is a rather extensive one and covers most of Europe. The horrors of the country that suffered most, Serbia, are told clearly and dispassionately. These rather primitive people were able to stand their hardships better than any other Europeans. We are shown how typhus ravaged the country and overflowed from the hospitals into the cemeteries. Typhus, while the most deadly enemy of the Serbians was not the only one. Tuberculosis, syphilis, typhoid, dysentery and malaria were encountered on every hand. Other barbarities of human making are also described and some of the recorded deeds of Serbia's neighbors are none too esthetic—some of the acts of the Serbians, however, are not given. When the cultural level of these Balkan people is considered their acts should cause

less wonderment than those of some of the more civilized countries. None of the little games of revenge played by people at war can bear close scrutiny.

We are also shown the gruesome pictures of Belgium, France and Italy and finally wavering Greece holding out for more gain. Then comes the summing up with the question: What is our civilization, what has it done? It has caused epidemic and death by violence, misery, and unhappiness—all through the maneuvering of a few senile statesmen. There were nine million soldier dead, ten million homeless, fifty million manless homes, ten million empty cradles, disease, death, desolation. How can one face these figures and favor war? How much can we who remain do to retrieve the results of this madness and folly? Perhaps we here in America have grown so accustomed to large figures that these will mean little; perhaps a few months in a vermin infested dugout decorated by decaying bits of our former comrades would be a more effective lesson; perhaps—but it is so difficult to measure sorrow and count the broken souls who suffered and were left behind. Is it fair to forget this bloody lesson in the joys and comforts that surround us?

THE PRIMITIVE IN POETRY.

The Golden Whales of California. And other rhymes in the American language. By VACHEL LINDSAY. New York: The Macmillan Company, 1920. Pp. iii-181.

Poems by a Little Girl. By HILDA CONKLING. With a Preface by AMY LOWELL. A Portrait by James Chapin. New York: Frederick A. Stokes Company. Pp. v-120.

These two books of poetry are, at first glance, as far apart as they can be, yet when more closely examined they present an analogy that may be well worth recording—Vachel Lindsay, a poet of standing, well known to followers of American verse, and Hilda Conkling, a little girl of nine, the one writing about all manner of things, most of them familiar to all of us, and the child telling her impressions to her mother.

Now where, you may ask, do we find common ground? On the one hand we find the crude primitive cadences used to describe the passing puppet shows, while the child gives voice to her musings little touched by the adult knowingness which comes from contact with the world. The one makes use of the infantile expressions of the race, while the other uses the lyrical images of her infantile life. Both use the lower, more primitive levels for their medium of expression.

Vachel Lindsay has popularized the booming melodies of negro chants; he has used them to describe prize fights, political conventions, and camp meetings. He has felt the throbbing pulse of the unsuppressed rhythmic heart beats of those unshackled by culture; he has woven these into strong stanzas which carry one away in a wild ecstasy. The child, unrestricted by the continual don'ts of nursemaids, as Amy Lowell so carefully explains, has presented her phantasies to her understanding mother. She, too, has clung rather tenaciously to reality and her phantasy has served to harmonize and make beautiful the little things about her and not as a retreat wherein she can escape from the world of reality. In both instances free-

dom, unrestraint and wholesomeness, are expressed.

The argument may be raised that all rhythmic expression is more or less primitive and has an underlying sex motive which it seeks to express. But there is a vast difference in the way it is used. We find the Chinese with their delicate fragments dating back to antiquity, Keats with his sophistication, Browning in his mystic intricacies, Maeterlinck in his symbolic musings, Longfellow's sentimentality, the self pity of Oscar Wilde, and the ponderousness of Wordsworth. Few are content with the purely primitive.

In Russia poetry and other means of expression in children have received more attention than in many other countries. The drawings, verses, and writings of children have been collected there for many years and much original material revealed. They have shown that frequently the phantasy minds of the children, prior to the time that their minds are pressed in the great conventional mold, give rise to many creations of rare beauty. Perhaps we, too, would find much of interest and not a little instruction if we were to give more encouragement to the thoughts and productions of children, if we would try to teach them less of the dry material we have to offer them, and learn more from them when they sing to us the melodies of their child souls or try to paint life as they see it before they are crushed in the mold of our making.

MYSTERY AND THE NEUROTIC.

The Vanishing Men. By RICHARD WASHBURN CHILD, Author of *Velvet Black*, etc. New York: E. P. Dutton & Co. Pp. i-324.

Most mystery stories are rather flimsy affairs. They are written with the object of putting down enough words on paper, using a rather circular plot and then trusting that the run of the book will be up to the average and so prove a successful business venture. This does not apply in the case of *Vanishing Men*. Carefully written, so as to hold attention to the last page; many thrills, and all the trimmings demanded of a worthy mystery tale and yet there is something more. The author has taken advantage of the little bypaths. The descriptive bits are very real and very beautiful. Most worthy of all, however, is his description of fear. One of the chief characters in the book is a man with a remnant of worth trying to disclose itself through a mass of less worthy characteristics. With great precision we find portrayed a hypochondriacal person who in the shifting of life's scenes makes a monetary success, but is a bankrupt in soul. Gradually the hypochondria becomes replaced by an anxiety neurosis and here Child draws a convincing clinical picture. He makes use of the dramatic material presented and handles it exceedingly well. Another point of interest is the projection of the fears to a harmless individual, the heroine. This is so subtly done that in time she herself feels that through some supernatural power she brings destruction to those who know her. But in the solving of the human riddle we find here as always these mystic forces are nothing but the interpretation of man's fears and weaknesses. There are many of these in the book and not until it is finished do we see them clearly.

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

MAN'S UNCONSCIOUS CONFLICT. A Popular Exposition of Psychoanalysis. By WILFRED LAY, Ph.D. New York: Dodd, Mead & Co, 1919.

THE CHILD'S UNCONSCIOUS MIND. The Relations of Psychoanalysis to Education. By WILFRED LAY, Ph.D. New York: Dodd, Mead & Co., 1920.

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Miscellany from Home and Foreign Journals

Epidemic Encephalitis.—L. P. Stephen and K. M. Bulchandani (*Indian Medical Gazette*, March, 1920) thus describe this disease as observed in Karachi. The onset may be acute and fulminant, or be insidious and take a more or less benign course. Very young children are rarely attacked; most patients are from fifteen to forty years of age. Five out of six are males. Cases are found in all grades of society. The onset is mostly insidious, with generally a stage of excitement at first. The patient may show nothing but a marked eccentricity and an easy excitability on slight provocation, and may have hallucinations and delusions. In other cases a sudden diplopia is the first symptom. Sooner or later the subject becomes lethargic and looks very sleepy. He lies with drooping eyelids, unconcerned about himself and his surroundings, has little or no initiative, and at the height of the disease may show a complete lack of spontaneous motion. If questioned a short intelligent response can generally be elicited, after a delay. Various types of paralysis appear, always related to cranial nerves and apparently of nuclear origin. Sensory nerves are rarely involved. Among other symptoms are general rigidity of the limbs, not always present, slight retraction of the head, tremors of the muscles of the face and limbs, sometimes restless movements of the latter. Muscular power is weak. Sugar may appear in the urine. Reflexes are present as a rule. There is little or no tendency to bed sores. In fulminant cases the patient may be struck down suddenly, become unconscious, and die sooner or later. Constipation is another definite feature. The tongue has a thin whitish coating and is large, thick and slightly indented at the edges. The breath is foul, the appetite unimpaired, the liver and spleen not enlarged. Retention of urine may be one of the first symptoms, or may appear later, to be still later replaced by involuntary passage of urine. Fever is generally present, the temperature ranging from 100° to 101° F., but rising to 104° or 105° in unfavorable cases. The skin is usually moist and there may be profuse perspiration. A rash, either rose or purpuric, may appear early or not until the thirteenth day.

In favorable cases the temperature falls by lysis, the patient begins to take interest, and his symptoms improve. Ptosis is generally the last symptom to disappear. In unfavorable cases with high temperature and acute toxemia the patients die of asthenia or edema of the lungs. The pathological changes described are those of hemorrhagic encephalitis. There may be pin point aggregate foci of hemorrhage more frequently in the mesoencephalon than elsewhere. A sort of patchy diffuse meningitis with cellular exudate has also been found. All cases showed a moderate amount of leucocytosis and were negative to blood parasites. The cerebrospinal fluid was clear and under no pressure. Concerning the nature of the disease, the writers do

not believe it to be connected with influenza, but refuse to venture an opinion as to whether it is a new disease or not. As regards treatment, calomel in fractional doses and salines are useful to relieve constipation and lessen intestinal auto-intoxication. Eserine was found to be of little use. Urotropin in gram doses was given without noteworthy results, but its use is recommended as the only useful antiseptic in cerebrospinal infections. Three patients were treated with an intravenous injection of salvarsan, after which the improvement was very rapid and striking.

The Virus of Lethargic Encephalitis.—C. Levaditi and P. Harvier (*Presse médicale*, March 31, 1920) have succeeded in reproducing encephalitis in a rabbit by intracerebral inoculation of an emulsion of gray matter from a human case of the disease. Upon repeated passage through rabbits the virus became a fixed virus and exhibited the property of killing the animal in from four to six days. The animal showed a torpid state, myoclonic manifestations, and symptoms of meningeal irritation. Postmortem there were found typical encephalitic lesions analogous to those described in man. The virus, which is not cultivable by the ordinary methods, may be kept in glycerine. It is a filterable virus, easily passing through No. 1 and No. 3 Chamberland filters. It can be inoculated into the rabbit not only by the cerebral route but also by way of the peripheral nerves. After repeated passage through rabbits it becomes pathogenic for the lower catarrhine ape. The general conclusion reached is that the virus is a specific, filterable virus, plainly distinct from that of epidemic poliomyelitis.

Lethargic Encephalitis.—Combemale and Duhot (*Bulletin de l'Académie de médecine*, April 13, 1920), among twelve cases of lethargic encephalitis seen at Lille, found a considerable variation in the earlier symptoms, some cases exhibiting a sudden onset with vomiting and distinct constitutional reaction and others beginning insidiously with somnolence, at first intermittent and later continuous. In some cases visual disturbances constituted the initial symptom, leading the patient to consult an oculist. Hypersomnia ranged from simple apathy to profound lethargy. Delirium and restlessness sometimes developed at night. At times there was distinct catatonia, and two patients presented, especially during convalescence, certain features suggesting Parkinson's disease. Most cases showed at least temporary diplopia. One third of the cases had internal ophthalmoplegia, and the possibility of facial or velopalatine paralysis was also noted. The knee jerks were generally exaggerated, sometimes unequally on the two sides; in two cases they were absent. Fever was variable, constipation frequent and obstinate, and marked loss of weight generally observed. Low blood pressure was found to be an important feature. The cerebrospinal fluid generally issued at high pressure; albumin was

normal or slightly raised, and sugar rather increased than diminished. Lymphocytosis in the cerebrospinal fluid was constant but slight; sometimes it persisted even after disappearance of the clinical signs. Urea in the blood and cerebrospinal fluid was high in the grave cases. In the diagnosis, the cerebrospinal fluid should always be taken into account. Marked lymphocytosis and hyperalbuminosis suggest rather a meningeal reaction due to tuberculous or syphilitic infection or to mumps, while slight lymphocytosis and slight or absent hyperalbuminosis confirm the suspicion of lethargic encephalitis, excluding from the start a neurosis or ordinary infection. The prognosis may be based upon the same series of factors. Death seems to occur in two ways. In some instances there are evidences of infection and fever, which may be very high; the rise in the temperature, either progressive or following a remission, is the most important sign. In the other group death takes place through secondary intoxication, gradual increase of the blood urea occurring as an indication of oncoming tissue disintegration.

Intraspinal Injection of Antitetanic Serum in Lethargic Encephalitis.—Laubie (*Bulletin de l'Académie de médecine*, March 16, 1920), having treated some cases of lethargic encephalitis with urotropin and collargol, without benefit, administered, in two subsequent cases, intraspinal injections of antitetanic serum, previously used with success by De Coquet in a case of encephalitis with pronounced rigidity, suggesting tetanus. In Laubie's first case thus treated, the injection, given on the fourth day, was followed in thirty-six hours by marked improvement, the temperature descending and the dyspnea, ptosis, photophobia, neck rigidity and somnolence passing off. In this case lumbar puncture had yielded clear fluid showing a little albumin, a few lymphocytes, no bacteria, and negative Noguchi and Bordet-Wassermann tests. The second patient exhibited somnolence, slow speech and movements, rigidity of the neck, and positive Kernig's sign. Lumbar puncture yielded fluid containing a few erythrocytes, 0.78 of albumin, no bacteria, and a weakly positive Noguchi. Injection of tetanus antitoxin was followed by disappearance of rigidity and Kernig's sign in forty-eight hours, and subsequently, of the other manifestations of the disease.

Lethargic Encephalitis.—G. Marinesco (*Bulletin de l'Académie de médecine*, March 16, 1920) notes that the more recent epidemic of this affection appears to include a considerable number of mild and atypical cases, in particular the ambulatory, myoclonic and meningeal forms, which were not seen in previous epidemics. He reports a case in a woman aged twenty-two, with pronounced lethargic and cataleptic symptoms but with preservation of the functions of the sensorium. The spinal fluid at first showed a marked lymphocytosis, and the temperature eventually rose above 41° C. The patient died twenty days after the onset. Post-mortem examination showed as the chief pathological disturbance an inflammation of the small and precapillary veins, the lymphatic sheaths of which were infiltrated with numerous lymphocytes, mon-

onuclears, plasma cells, and fibroblasts. Where destruction of medullated fibres or hemorrhagic foci occurred, macrophages laden with fat or pigment were seen. New formation of capillary vessels was likewise detected. Disseminated foci of hemorrhage were found in the gray substance of the floor of the fourth ventricle and of the aqueduct of Sylvius. No corresponding inflammation of the arteries could be found. The infundibulum was but slightly involved and the hypophysis not at all. The pathological changes were not limited to the corpora quadrigemina and cerebral peduncles, but had extended to the thalamus and metathalamus, the telencephalon, the corpus striatum, and even the cerebral cortex. In the medulla, pons and peduncle there was marked infiltration of the vessels of the raphe. The raphe and even the nerve roots of the hypoglossal, glossopharyngeal, and pneumogastric showed foci containing not only mononuclear lymphocytes and plasma cells but also, and chiefly, enlarged and proliferated neuroglia cells of the fibrous type. Inflammation of the neuroglia about the blood vessels was manifest in all the cases of lethargic encephalitis examined post-mortem by the author. Attention is called to the similarity of the pathological changes in lethargic encephalitis to those found in African sleeping sickness, general paralysis, and infantile paralysis. On the whole, no pathological peculiarity completely distinctive of lethargic encephalitis is as yet known. Neuroglia nodules have been found in the dentate nuclei, white matter, and other portions of the cerebellum by the author as well as by Charles Box. The pathogenic agent is asserted to be different from those of influenza and of infantile paralysis. It is probably propagated by the throat secretions. It is carried by the lymphatic vessels to the mid-brain and medulla, where the most pronounced pathological changes are found.

Serpiginous Character of Lethargic Encephalitis.—C. Achard (*Bulletin de l'Académie de médecine*, April 6, 1920) points out that the protean character of the clinical picture in lethargic encephalitis applies not only to different cases but likewise to the individual case, in which widely divergent clinical manifestations may follow one another in close succession. One patient had had the characteristic somnolence for one week before admission to a hospital. Upon admission he talked volubly, showed interest in his surroundings, moved without difficulty, and sat up in bed, but complained of left frontal headache. Next day the temperature rose to 39.2° C. and lumbar puncture yielded a hemorrhagic fluid which remained yellow upon centrifugation. Three days later fluid presenting these same features was withdrawn. The temperature remained above 38° C. for a week. Suddenly, after defervescence and marked diminution of the headache, complete paralysis of the left oculomotor nerve appeared. Had the initial disturbance not been known, independent diagnoses of meningeal hemorrhage and later of oculomotor paralysis, both of obscure origin, might have been made. The left pupil was dilated and unresponsive to light in this case. Reference is made to a similar case, with initial som-

nolence, reported by Achard and Paiseau in 1904, which was probably one of lethargic encephalitis. Stress is laid on successive stages marked by different clinical phenomena as a diagnostic feature in this disease. This variation of the symptoms may be correlated with present knowledge of the pathology of the disorder. The brain lesions, chiefly vascular in their localization, may affect different nervous structures to a varying extent and for variable periods of time, passing from one point of the midbrain to another, and also to the cerebral hemispheres and spinal cord. The course followed by the lesions is serpiginous, and this is perhaps the most singular feature of the disease, for no other form of encephalitis, whether acute or chronic, presents it to such a high degree.

Clinical Signs and Meningeal Reaction in Lethargic Encephalitis.—Jeanselme (*Bulletin de l'Académie de médecine*, April 6, 1920) reports a case of lethargic encephalitis in which the initial soporose and paretic stage of the disease was followed by a stage of myoclonic movements and a third stage of choreiform manifestations and atetosis. He discusses the question whether these later manifestations should be looked upon as sequelæ or as the expression of a recrudescence of the encephalitis. Three lumbar punctures carried out at successive intervals of two weeks and one week proved highly significant in this connection. The first puncture showed thirteen lymphocytes and 1.5 grams of albumin; the second, three lymphocytes and 0.5 gram of albumin, and the third, twelve lymphocytes, 0.8 gram of albumin and 0.38 gram of sugar. Thus, during the soporose and paretic stage there was slight but distinct meningeal irritation. During the remission which preceded the manifestations of incoordination the meningeal reaction was perceptibly lessened. Finally, upon appearance of the myoclonia and chorea, a recrudescence of the meningeal reaction took place. In view of the close agreement between the clinical symptoms and these puncture findings, the myoclonia and chorea need not be considered as sequelæ appearing during convalescence but as a new stage in the active course of the disease, doubtless associated with migration of the pathogenic agent to different structures.

Increased Cerebrospinal Sugar Content in Epidemic Encephalitis.—C. Dopter (*Bulletin de l'Académie de médecine*, March 2, 1920) refers to the case of a man, aged twenty-five years, complaining of slight frontal headache and general lassitude, dull pain in the right scapular and cervical regions, diplopia, accommodative asthenopia, slight external strabismus, mydriasis, paresis of the lips on one side, doubtful Kernig sign, and slight fever. Ten months before, this patient had had a chancre and had been treated with novarsenobenzol; hence a tentative diagnosis of syphilitic meningitis was made, though the Bordet-Wassermann test was negative. The cerebrospinal fluid was clear and contained twelve lymphocytes per cubic millimetre and some albumin. Sugar, however, was found present in the unusual amount of 0.85 gram per litre. This finding was taken to exclude both syphi-

litic and tuberculous meningitis, and lethargic encephalitis was suspected. Next day the patient showed marked restlessness and delirium, followed by myoclonic twitchings and somnolence; death took place a week later. From previous personal cases and the present case, as well as from the observations of other clinicians, Dopter concludes that increase of sugar in the cerebrospinal fluid is of value in differentiating lethargic encephalitis from meningitis in its various forms. This increase doubtless results from hyperglycemia, due in turn to disturbance of the floor of the fourth ventricle. In tuberculous meningitis sugar in the cerebrospinal fluid is diminished or entirely absent, while in syphilitic meningitis it is generally normal in amount and only exceptionally in excess. It should be borne in mind that increased sugar content may occur also in affections other than epidemic encephalitis, e. g., diabetes, uremia, pneumonia, Malta fever, rabies, pertussis, brain tumor, amyotrophic lateral sclerosis, cerebral hemorrhage, and occasionally in chronic nervous syphilis. Furthermore, the sign is not constant in epidemic encephalitis. In one case examined late in the course of the disease, the sugar content was subnormal. Possibly in cases of encephalitis high up, without involvements of the bulbopontine region, excess of sugar is not to be expected.

Lethargic Encephalitis.—A. Pic (*Lyon médical*, March 25, 1920) reports a case of epidemic encephalitis unattended with somnolence, and thinks the term lethargic encephalitis might with advantage be replaced by acute epidemic superior poliomyelitis, at least in some cases. By way of prophylaxis, antiseptics of the mouth and pharynx of patients and convalescents, as well as among the contacts and ordinary influenza cases, is indicated, the pathogenic agent apparently entering through the nasopharynx and persisting there. In the treatment, lumbar puncture may be of service in a few cases with meningeal reaction, and hexamethylenamine is also useful. To stimulate the leucocytes, colloidal metals and the fixation abscess are available, as are also subcutaneous injections of oxygen for detoxicatory purposes. Warm baths or the hot pack, together with an icebag to the head, may be used for sleeplessness, nerve pains, restlessness, and meningitic symptoms. Adrenalin is useful for heart weakness and low blood pressure, as in ordinary influenza. For insufficient diuresis, rectal injections of isotonic glucose solution by the Murphy method may be employed. By such means the mortality—so far reported as twenty-five to thirty-five per cent.—may be lowered.

Experimental Research on the Virus of Lethargic Encephalitis.—C. Levaditi and P. Harvier (*Bulletin de l'Académie de médecine*, April 20, 1920) note that on February 10, 1920, they were successful for the first time in inoculating a rabbit with the disease, using an emulsion of brain tissue from a case of encephalitis in a woman aged forty-five. The tissue was obtained aseptically from the cortex, midbrain and medulla, and was inoculated in the dose of 0.2 mil into the brains of two rabbits and

one monkey. One of the rabbits died on the eighth day. Cultures of the brain and cardiac blood were sterile, and the nerve centres showed the typical lesions of meningoencephalitis of the cortex and midbrain. The two other animals showed no disturbance whatever. An emulsion of brain tissue from the dead rabbit was inoculated in the same dose into two other rabbits, which died on the sixth and seventh days, respectively, and showed identical brain lesions. The virus from one of these rabbits was subsequently passed through a number of other animals in succession. The experiments showed that the incubation period of the disease after intracerebral inoculation averages four or five days. Symptoms appear only a few hours before death and consist of a torpid condition with signs of meningeal irritation and epileptoid and myoclonic spasms in the limbs or choreic movements. The virus can be preserved in glycerin, and is a filterable virus, readily passing through the Chamberland filters Nos. 1 and 3. The virus may be inoculated into the rabbit through the sciatic nerve as well as through the anterior chamber of the eye. The virus does not seem to be pathogenic for monkeys when directly obtained from man, but becomes so after having passed a certain number of times through rabbits. It then becomes pathogenic likewise for guinea pigs. The virus retains its virulence after desiccation in vacuo in the presence of sulphuric acid and after desiccation in a watch glass in contact with caustic potash. The virus is present in the spinal cord of animals inoculated by the cerebral route. The serum of patients convalescent one month from lethargic and myoclonic encephalitis has no neutralizing action upon the virus. Experiments upon crossed immunity with the virus of poliomyelitis, upon vaccination of animals, and upon serum treatment are now being carried out.

The Oculocardiac Reflex in Lethargic Encephalitis.—A. Litvak (*Presse médicale*, February 14, 1920) states that in lethargic encephalitis the oculocardiac reflex is rather active. The more deeply somnolent the patient, the more readily the reflex is elicited. In syphilitic meningitis, this reflex is always absent, while in tuberculous meningitis it is only uncommonly present and is feeble. In lethargic encephalitis there may be observed a condition of dissociation between the tone of the circulatory centre, which may be lowered, and the oculocardiac reflex, which may be rather pronounced.

Syphilis and Lethargic Encephalitis.—E. Jeanseime (*Bulletin de l'Académie de médecine*, March 2, 1920) states that lethargic encephalitis may readily be overlooked in cases of suspected syphilis of the central nervous system. Many symptoms are common to both disorders, from dissociated paralysis of the cranial nerves and the Argyll-Robertson pupil to convulsive seizures and apoplectoid coma. The author's case was characterized by persistent somnolence from which the patient could readily be roused, complete mental clearness, and a diffuse paretic condition with motor incoordination reflecting cerebellar involvement. The tendon reflexes were markedly disturbed, ankle clonus was present,

and bulbar involvement was shown by tachycardia, dissociation of the pulse and temperature, and polypnea on slight exertion. Lumbar puncture at first showed 1.5 grams of albumin per litre, positive Bordet-Wassermann, and thirteen lymphocytes per cubic millimetre. Sixteen days later the lymphocytes had dropped to three and the albumin nearly to normal, and the Wassermann was negative. The blood Wassermann had been negative on two occasions. The initial positive cerebrospinal Wassermann is thought to have been due to the hyperalbuminosis. A positive reaction has already been occasionally noted in nonsyphilitic persons in the presence of marked hyperalbuminosis and xanthochromia of the cerebrospinal fluid.

Late Sequelæ of Lethargic Encephalitis.—Henri Claude (*Bulletin de l'Académie de médecine*, March 2, 1920) reports four cases illustrating the fact that encephalitis patients may continue for a long period after apparent recovery to be troubled with asthenia, inability to work, and the recurrence upon fatigue of particular symptoms, such as motor paresis, choreiform movements and visual disturbances. Altered disposition may also persist for some time. These sequelæ are explainable on the basis of the vascular and perivascular pathological changes found in cases studied postmortem.

Prognosis and Treatment of Epidemic Encephalitis.—J. Chalier (*Lyon médical*, April 25, 1920) estimates the mortality rate of lethargic encephalitis as forty to fifty per cent. Rise of the temperature to 40° C. is an unfavorable prognostic feature, as are also tachycardia—with or without fever—and polypnea, which suggest bulbar involvement. Cases manifesting excitement are more dangerous than those exhibiting somnolence alone. An unfavorable meaning attaches to the dissemination and progression of certain symptoms, such as myoclonic movements, particularly with participation of the diaphragm, and more or less diffuse choreic manifestations. Regarding treatment, Chalier considers the administration of serum from convalescents the most rational measure. In a recent severe case its use was followed by recovery.

Epidemic Encephalitis and Catatonic Symptoms.—Earl D. Bond (*American Journal of Insanity*, January, 1920), in a review of three cases found that mild and transient, but definite, symptoms are usually missed in excited, seclusive or indifferent patients. In one, strabismus went unrecognized at home; another, because she had no psychosis, was able to give information which would have been lost in a person less clear. Some facts came out in retrospective accounts which few can give satisfactorily. The author has elsewhere emphasized that fevers are usually overlooked in difficult and chronic patients. There is a great reward for the first hospital for mental diseases which can carry out good, thorough and repeated physical examinations on all its patients. A catatonic episode in a chronic mental patient demands and rewards the same skillful medical and nursing care which is given to the general hospital patient with acute encephalitis.

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DIAGNOSIS AND TREATMENT OF HYPERTHYROIDISM.*

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The great difficulty in the treatment of many diseases is that we are constantly confronted with the end results of the disease, when the chances of bringing about a cure are almost nil. A patient with diphtheria who dies today does so because diphtheria antitoxin has either been used in too small doses, or used too late. Thousands of patients with tuberculosis present themselves with extensive disease of the lungs that can never be cured. Early diagnosis, which spells cure, has been missed.

Hyperthyroidism is frequently not diagnosed until the patient has all the characteristics described in the case quoted by Graves (1). He thus describes his case of exophthalmic goitre, said to be the first in the literature:

"A lady, aged twenty, became affected with some symptoms which were supposed to be hysterical. This occurred more than two years ago; her health previously had been good. After she had been in this nervous state about three months, it was observed that her pulse had become singularly rapid. This rapidity existed apparently without any cause and was constant, the pulse being never under 120, and often much higher. She next complained of weakness on exertion, and began to look pale and thin. Thus she continued for a year, but during this time she manifestly lost ground on the whole, the rapidity of the heart's action having never ceased. It was now observed that the eyes assumed a singular appearance, for the eyeballs were apparently enlarged, so that when she slept or tried to shut her eyes, the eyes were incapable of closing. When the eyes were open the white sclerotic could be seen to a breadth of several lines all round the cornea."

While it is true that many patients with well marked exophthalmic goitre recover under rest and other measures, it is equally true that every patient who has the marked characteristics of the disease has undergone a change in the heart muscle, and other organs of the body, which may cause death or prolonged invalidism. For this reason chiefly, I have selected hyperthyroidism for this paper, that we may discuss, first, early diagnosis and differential diagnosis and then treatment of the

condition in the early stages, and finally the treatment of cases in the later as well as the latest stages.

The symptoms of well developed exophthalmic goitre as described by Graves (1), and those which usually are described in textbooks are so striking that he who runs may read. Mental alertness, tachycardia, muscular tremor, exophthalmos, visible pulsation of the vessels, tumultuous action of the heart, sweating, warm hands and feet, frequently cardiac murmurs, enlarged, usually pulsating thyroid gland, tendency to flushing of the skin, an erythematous rash following handling of the skin, weakness, emaciation, diarrhea and vomiting, sometimes arthritis; all of these symptoms may be present in the advanced case of exophthalmic goitre, or Graves's disease. Of these, the protruding eyes, the appearance of fright, and the enlarged thyroid are the symptoms which attract the physician as the patient enters his examining room or even when he meets such a person on the street. We must always keep in mind the extreme cases of hyperthyroidism which may occur with little or no thyroid enlargement. Such a patient always has decreased sugar tolerance; unusual reaction to the injection of adrenalin; is made worse by taking preparations of the thyroid gland, and has an increased metabolic rate.

Unfortunately, many or all of the symptoms are present before active treatment is considered, either by the patient, or the examining physician. It is the patient in this condition, showing end results of the disease, who is in danger, and upon whom surgical operation is a serious procedure, and upon whom the recognized medical treatment is so frequently a failure. It is a condition fairly comparable to that of a patient in the second week of an active appendicitis.

A condition which is often indistinguishable from the one described, which demands somewhat the same treatment, occurs in the hypertrophic atoxic goitres, as described by Plummer (3).

Why do patients not present themselves for treatment before reaching this extreme condition? Why are they not treated sooner?

First, because patients consider themselves nervous, and delay treatment, or the physician to whom they apply in the early stage of the disease considers the patient as neurasthenic, as having an irritable heart, or heart disease, until the unmistakable signs of advanced Graves's disease, exophthalmic goitre, present themselves.

*The references to this article will appear in the reprint.

Thanks to the intensive studies of Charles Mayo, H. S. Plummer, Louis Wilson and Kendall (4), the condition of hyperthyroidism and other conditions due to disturbance of the thyroid gland, have been brought so prominently before the profession that we are beginning to realize the condition in its early stages, and hence the selected treatment is more effectual and less dangerous.

A short description of some of the later laboratory methods which help in the differentiation of these conditions, particularly in the early stage, seems desirable at this point. Hereafter they will be referred to as:

1. Increased metabolic rate; 2, thyroid feeding; 3, adrenalin test, Goetsch test, and 4, decreased sugar tolerance.

INCREASED METABOLIC RATE.

Dubois (5) in a paper on the Respiratory Calorimeter in Clinical Medicine says that the normal average basal metabolism is 34.7 calories an hour to the square metre of the surface of the body. He also states that in forty-four cases of exophthalmic goitre, the increase of metabolism is the most striking effect of thyroid activity, and is strictly proportionate to the activity of the disease.

Means and Aub (6) state that in 224 observations on toxic goitre, and eighteen cases of nontoxic goitre, the toxicity, judged clinically, runs nearly parallel with the rise in metabolism. I believe that the estimation of the metabolic rate of a patient is the most accurate laboratory method in differentiating mild cases of hyperthyroidism from conditions which simulate it. The great drawback at present to this valuable test is that it has to be made in an institution which possesses the proper apparatus for the work, hence it is not as practicable as the second test—thyroid feeding. The value of estimation of the metabolism test is shown in the following important case.

CASE I.—Mrs. L. This lady was sent for a diagnosis as to whether an evident goitre was the cause of her symptoms.

Her chief complaint was palpitation of the heart and throbbing of her neck, she had headache, was extremely nervous, had gained much weight. She was in the midst of her menopause; was extremely neurasthenic. She had had a goitre for several years. She had tremor and attacks of diarrhoea. Her weight was 205 pounds. There was an enlarged thyroid gland which was rather soft. Auscultation over the gland did not reveal pulsation or thrill or murmur. There was a slight tremor of her hands. Examination of her heart showed a rate of about 100. She was quite hysterical. Her blood count, except for a slight anemia, was normal, and the differential count was normal. Her blood pressure was 200 systolic and 110 diastolic. Her urine was normal. Her metabolic rate was twenty-seven calories to the cubic metre of her body. This latter fact caused the case to be classed as neurasthenia accompanying menopause, and not one of hyperthyroidism which it simulated. The subsequent history of the case showed this view to be correct.

THYROID FEEDING.

It is generally recognized that a person who is suffering from an increased activity of the thyroid gland will suffer an exacerbation of all of the symptoms when given desiccated thyroid gland.

Smith (20) used this test in the examination of thirty cases among soldiers at Fort Travis, Texas, with the idea of differentiating between this condition and the effort syndrome. Six of the patients responded to the test and were diagnosed upon this and upon other grounds as having hyperthyroidism. Lewis (10) believes that cases of effort syndrome are not due to hyperthyroidism and that use of thyroid feeding will differentiate between the conditions.

CASE II.—Several years ago Miss P. was seen with Dr. Merscher of Germantown, Pa. She had not been well for five or six years. Violent attacks of gastric pain, with much diarrhoea. Her pulse was 80 to 94. Blood pressure 135 diastolic and 180 systolic. The eyes were prominent; palpebral angle wide. The thyroid was enlarged. There was much muscular tremor. She was put upon thyroid feeding with an immediate exacerbation of her symptoms. In October, 1914, the upper pole of the right lobe of the thyroid was ligated. There was a temporary improvement. In January, 1915, the diarrhoea had disappeared, her weight was 118 pounds, there was much perspiration. On May 10, 1915, she was nervous, her weight was still 118. A ligation of the other lobe was done. A great improvement followed. On October 10, 1919, she weighed 134 pounds, was the picture of health, all signs of hyperthyroidism had disappeared.

Smith (20) describes a method of thyroid feeding as follows:

"The men were put to bed and isolated in one end of the ward. Other convalescent patients were instructed not to disturb them. The desiccated thyroid gland of sheep was used, Lilly preparation. The initial dose was one fourth grain morning and evening. This dose was increased one fourth grain each day and was continued until there was a response or the patient was getting five grains a day. The pulse was taken four times a day. The nurse was instructed to take the pulse whenever possible when the men were asleep. A definite increased pulse rate while the patient was asleep, associated with increased nervousness and irritability, was regarded as a positive reaction, and the thyroid feeding was discontinued.

THE GOETSCH ADRENALIN TEST.

This was described by Goetsch (7) in July, 1918.

"On the day of the test the patient is placed as nearly as possible under normal conditions. By this we mean in a warm room without the appliances such as hot water bottles, heating devices, which are common in the outdoor treatment of tuberculosis. The patient, of course, is to take his meals in bed. We emphasize these precautions because of the well known hypersensitiveness and irritability of hyperthyroid and tuberculous patients. Because of the tendency of the thyroid to hyperactivity at the menstrual period, the test is not given during this time.

"We proceed with the test as follows: Two readings are taken, at five minute intervals, of the blood pressure, systolic and diastolic, pulse rate and respiration. The notes are made of subjective and objective condition of the patient. This includes the state of the subjective nervous manifestations—the throbbing, heat and cold sensations, asthenia, and the objective signs such as pallor and flushing of the hands or feet, the size of the pupils, throbbing of the neck vessels, and precordial tremor, temperature of the hands and feet, perspiration and any other characteristic signs or symptoms noticed. These signs are all noted previous to the injection of the adrenalin, so that comparison may be made after the injection.

"A hypodermic syringe armed with a fine needle which, when inserted, causes little discomfort, is then used to inject 0.5 c. c. of the 1/1000 solution of adrenalin chloride into the deltoid region, subcutaneously. Intramuscular and intravenous injections are not given. Readings are then made every two and a half minutes for ten minutes, then every five minutes up to an hour, and then every ten minutes for a half hour longer. At the end of one and a half hours the reaction has usually entirely passed off, sometimes earlier. The repeated early readings are made in order not to miss certain reactions on the part of the pulse and blood pressure that may come on in less than five minutes after the injection is made. This is particularly true of cases of active hyperthyroidism.

"In a positive reaction there is usually an early rise in blood pressure and pulse of over ten points; there may be a rise of as much as fifty points or even more. In the course of from thirty to thirty-five minutes there is a moderate fall, then a second slight secondary rise, then a second fall to the normal in about one and a half hours. Along with these one sees an exaggeration of the clinical picture of hyperthyroidism brought out, especially the nervous manifestations. The particular symptoms of which the patient has complained are usually increased, and in addition there are brought out many symptoms which have been latent. Thus it is not uncommon to have extra systoles brought out after the injection of the adrenalin. The patient is usually aware of them, and may tell one that she has felt this same thing a year or two previously, at which time the symptoms of the disease were more active.

"The following may all or in part be found; increased tremor, apprehension, throbbing, asthenia, and in fact an increase of any of the symptoms of which the patient may have complained. Vasomotor changes may be present; namely, an early pallor of the face, lips and fingers, due to vasomotor constriction, to be followed in fifteen or thirty minutes by a stage of vasodilation with flushing and sweating. There may be a slight rise of temperature and a slight diuresis.

"In order to interpret a test as positive we have regarded it as necessary to have a majority of these signs and symptoms definitely brought out or increased."

From a review of the literature it would seem that this reaction is practically always present in

hyperthyroidism, but that it may occur in other conditions, noticeably in the effort syndrome. Peabody (13) and his coworkers examined sixty-five soldiers with irritable hearts by this method for the presence of hyperthyroidism, with a positive response to the test in sixty per cent. of the cases, a doubtful response in thirty per cent., and a negative response in ten per cent. That is, there was a positive result from the adrenalin test in sixty per cent. of the cases which did not show hyperthyroidism by other tests. Therefore, the adrenalin test is of less value than the metabolic rate or thyroid feeding. According to the article from which the abstract was made, however, the test is never positive in tuberculosis alone.

SUGAR TOLERANCE.

For a long time it has been known that patients with exophthalmic goitre had a low sugar tolerance. Harriman and Hirschman (8) and Wilder and Sansum believe that increase of thyroid function is accompanied by a decrease in sugar tolerance, and these authors in addition express the opinion that the hypodermic use of epinephrin is followed by a marked hyperglycemia—sugar will appear in the urine also after the Goetsch test. This test is of undoubted value, but like the adrenalin test is probably corroborative and not absolute.

Examination of the blood.—Kocher announced that the differential count was of considerable value in the differentiation of hyperthyroidism, while Plummer (11) in the tabulation of 578 cases of exophthalmic goitre, found that while the neurophiles are low and the lymphocytes high, the blood count is of relatively little value in diagnosis.

The conditions for which hyperthyroidism in any stage may be mistaken, or which may be mistaken for hyperthyroidism, are numerous. Among them are: 1, Neurasthenia; 2, irritable heart, or its synonyms, effort syndrome, functional papitation, 3, organic heart disease; 4, tuberculosis; 5, interstitial nephritis; 6, gastrointestinal disturbances; 7, arthritis; 8, local conditions of the eye, and 9, hypertrophic atoxic goitre.

Upon decision as to whether the patient is suffering from one or another of these conditions the treatment absolutely depends. A differentiation is therefore necessary. The limit of time which can be devoted to this paper will of necessity demand a rather superficial review. Enough will be attempted, however, to make the points intelligible.

DIFFERENTIATION OF HYPERTHYROIDISM.

Neurasthenia is constantly confused with hyperthyroidism. The most serious mistake is to consider a case of mild hyperthyroidism as a simple neurasthenia until the patient has Graves's disease in a well advanced form. The neurasthenic may have muscular tremor even when the arm is held horizontally with the fingers spread apart, but this tremor is intermittent, and is not continuous as in hyperthyroidism.

The mental characteristic of the neurasthenic is an introspective one, and not the alert apprehensive mind of the hyperthyroid patient. The neurasthenic does not have the flushing characteristic of disease of the thyroid.

The rapid heart of the neurasthenic frequently becomes slower when the patient is recumbent for a short time, as opposed to the continuous tachycardia of the hyperthyroid patient. The heart is not dilated in the neurasthenic individual as it is in the moderate or advanced hyperthyroid patient.

The thyroid of the neurasthenic if enlarged may pulsate, but the pulsation is evidently transmitted from the vessels below the gland is not the seat of a murmur, or a thrill. The eyes do not protrude, and there are none of the other characteristic eye symptoms.

Increased appetite is a characteristic of hyperthyroidism (14); the neurasthenic usually has a loss of appetite. Finally, the neurasthenic does not respond to thyroid feeding; the metabolic rate is not increased; the Goetsch test is not positive, and sugar tolerance is normal.

Irritable heart.—This is a condition frequently seen in civil practice, and was first described by Da Costa. It was very frequently noticed in examination of draftees by draft boards and by the cardiac boards of the army, 1917-18. It is characterized by the inability to withstand exertion, by tachycardia which is increased by exercise, by a soft murmur over the apex or the base, which may disappear on exercise, and by muscular tremor.

These symptoms notoriously resemble those of hyperthyroidism, but the eye symptoms of exophthalmic goitre are wanting, the thyroid gland is normal, or if hypertrophied is not the seat of intrinsic pulsation or thrill. There is no erythematous rash. The laboratory signs of thyroid feeding and increased metabolism rate are wanting, while the adrenalin test may be present in sixty per cent. of the cases (13), and the sugar tolerance test is negative except in rare instances (3).

Organic heart disease, particularly mitral stenosis, is frequently mistaken for hyperthyroidism, and the opposite mistake is often made. Close attention to the actual condition of the heart, the presence of a confirmed murmur due to endocarditis, the characteristic murmur of mitral stenosis, the fact that the rate of the rapid heart of organic heart disease is reduced upon rest, the absence of the peculiar alertness of hyperthyroidism with its wavelike exacerbation (14), the absence of the eye symptoms, the negative findings in the four laboratory tests, mark the case as one of organic valvular disease.

Myocarditis in older persons may also be mistaken for hyperthyroidism, but attention to the actual condition of the heart, and the absence of characteristic symptoms of hyperthyroidism, will mark the case.

The following case shows the difficulties sometimes encountered in making the diagnosis.

CASE II.—Mrs. G. S., wife of physician, seen March 14, 1918. Felt weak, no cough, no dyspnea, but palpitation of the heart, nervous spells, vomiting in the morning, bowels rather loose, much worried, marked taché, no exophthalmos or other eye signs. There was some tremor of the hands. The thyroid was decidedly enlarged, but there was no pulsation or thrill. The heart dullness reached to one inch to the right of the sternum, the nipple line, and the upper third rib. There was a suspicion of a

presystolic murmur. On rest in bed the heart dullness decreased, the presystolic murmur became very evident, the thyroid gland decreased in size. The progress of the case marked it as a true mitral stenosis, notwithstanding the first appearance of exophthalmic goitre.

Tuberculosis.—Symptoms indicative of hyperthyroidism may frequently complicate certain cases of frank tuberculosis, or cases in which there is a suspicion of tuberculosis, but in which the physical signs are not marked. Of course the physical examination and history of the case must be the sheet anchors in making a diagnosis, but it is these borderline cases in which Goetsch (7) claims so much for his test. He says: "It should be mentioned furthermore that the adrenalin hypersensitivity reaction affords us a means of early diagnosis of hyperthyroidism at a stage before the disease has seriously damaged the individual or perhaps incapacitated him. It thus allows us to appreciate an early mild hyperthyroid element in tuberculosis should the two diseases exist concomitantly."

It is in these cases also that thyroid feeding and metabolic rate should be of greatest value.

Interstitial nephritis.—Barker (15) described the presence of exophthalmos in interstitial nephritis, and calls attention to the danger of mistaking certain cases of nephritis for hyperthyroidism. The constant high blood pressure, polyuria and urinary findings, and the absence of findings of hyperthyroidism other than the eye symptoms, and the negative findings, should make the diagnosis simple.

Gastrointestinal conditions.—In rare cases of hyperthyroidism, the outstanding symptom of the disease, is diarrhea. The following case illustrates this condition in a typical way.

CASE III.—Mrs. W. For years had an intractable diarrhea. She appeared for treatment August 26, 1909, with the following complaints:

Diarrhea for three years, eight to ten bowel movements a day; lost thirteen pounds in two years; always nervous; some palpitation of the heart and some dyspnea. There was a large cystic goitre. The second pulmonary sound was accentuated. At this time the goitre was not considered in relation to her diarrhea.

On May 3, 1913, she returned with evident signs of a toxic goitre, including diarrhea and arthritis. Her elbows, shoulders, hands and feet had been intermittently painful and swollen during the existence of the goitre. Since the removal of the goitre five years ago the joint pains have disappeared and never returned.

Her goitre was removed with no untoward results, and the condition of the patient immediately improved—the diarrhea and arthritis disappeared. In 1919 she reappeared at the office having gained thirty pounds and was the picture of health.

Arthritis.—I am not aware that arthritis has ever been considered as a symptom of hyperthyroidism, but in the case of Mrs. W. and Mrs. T. whose history follows, in both instances the arthritis disappeared with the removal of the thyroid gland. Whether this was a mere coincidence I am not certain, but the facts are accurate, and I wish to put

them on record. Unfortunately there is no note as to any of the laboratory methods, and therefore one cannot express a positive opinion as to whether the hyperthyroidism which existed intermittently was the cause of the arthritis. Certainly, however, the arthritis disappeared upon the removal of the gland.

CASE IV.—Mrs. T., aged thirty, was examined by Dr. Corson of Cynwyd, January 15, 1915. When she was thirteen years of age a goitre developed with toxic symptoms. This attack of hyperthyroidism disappeared, to reappear three times in the last seventeen years. For the past twelve years she has had painful, enlarged joints in various parts of the body; for the last five years these were much worse, until now she is an invalid from the painful joints, arthritis or peri-arthritis.

On examination she had a large goitre which apparently was not toxic unless her arthritis was an indication of toxicity. Her joints are the seat of swelling, pain and stiffness. She was seen by Dr. Halstead, of Baltimore, and her thyroid was removed. I based the reason for the operation on the fact that Mrs. W. who had had arthritis and hyperthyroidism was cured of the arthritis after thyroidectomy.

A letter from her physician dated December 4, 1919, states that since her thyroidectomy she was completely relieved of her arthritis and muscular pains, which she had continuously for twelve years.

Local conditions of the eye giving rise to exophthalmos.—Such conditions might, of course, give rise to the appearance of hyperthyroidism, but the entire absence of other signs would negative that diagnosis.

Hypertrophic atoxic goitre.—Whenever a case of simple hypertrophic goitre presents itself, the question as to its toxic character must always be taken into consideration. An atoxic goitre is entirely void of all of the symptoms of hyperthyroidism. The fact that in the patient there may later develop toxic symptoms, so well described by Dr. H. S. Plummer, must always be taken into consideration.

As a diagnostic sign between a hypertrophic atoxic goitre in which there develops toxic symptoms, and a toxic hyperplastic goitre, true Graves's disease, H. S. Plummer cites figures to show that the hypertrophic goitre develops symptoms after an interval of fourteen and a half years, while the true exophthalmic goitre is observed only nine tenths of a year before the toxic symptoms (13).

It will be seen that while there are a number of conditions which simulate hyperthyroidism the chief difficulties in differentiation occur in the early stages. It is scarcely possible to mistake a well developed case of exophthalmic goitre for any other condition, and the opposite mistake is likewise unlikely to occur. It therefore is important that all of us have in our minds the possibility of making mistakes in the early stages, and do all we can to avoid them. The laboratory methods which have been described are of the utmost value in differentiating difficult cases, especially the metabolic rate which is always increased in exophthalmic goitre.

TREATMENT.

Unfortunately the ultimate cause of hyperthyroidism is not yet certain. The researches of Can-

non (16) and Wilson (17) point to some irritation of the sympathetic as the possible actual cause. Certainly Cannon has proved that the nerve supply of the thyroid is from the sympathetic, and Wilson has found that "certain bacteria may cause histological pictures in the sympathetic ganglia and in the thyroid gland which parallel those found in progressive and regressive exophthalmic goitre."

For these reasons, and due to the fact that we are attributing many general conditions to local infections (frequently I believe without sufficient grounds, especially many teeth and numerous tonsils are removed without sufficient grounds), the search for tooth abscesses, infected foci in tonsils, and other localities should be made. If found they should be corrected in order that we may do possible good, and in order that we may not later accuse ourselves of negligence.

Kendall's (2) epoch making investigations appear to prove that the iodine containing compound, thyroxin, is the positive cause of the toxic symptoms found in hyperthyroidism, whether it is that of true exophthalmic goitre, or the toxic symptoms in cases of hypertrophic atoxic goitre. Hence measures both medical and surgical which will prevent the increase and absorption of this substance must be adopted.

Perhaps it is the uncertainty of the cause which causes so many and often opposite views as to method of treatment. Still more likely the different methods of treatment may be due to the fact that in many cases of hyperthyroidism, and even in some cases of well developed exophthalmic goitre the symptoms disappear and the patients entirely recover without any accurately directed treatment. Whatever methods have been used in these cases are heralded as a cure.

The positive knowledge which we now possess that the iodine containing compound, thyroxin, is the cause of the toxic symptoms (18) puts us on firm ground from which we may direct our treatment, for whatever the cause of the hypersecretion of this substance, we know that long continued secretion will lead to invalidism and death.

The problem then is, what is the best treatment for the condition of hyperthyroidism? Discussion of this most important phase of the subject must include the so-called medical treatment, surgery, röntgen ray, and injection methods.

The physician who recognizes that there is no one plan of treatment for all patients, is the safest one for the patient, because he is the one most likely to bring about a cure of the condition. Some patients are fit for one kind of treatment alone, others demand the combination of two or more forms of treatment. The knowledge and ability to select the proper patient for a special treatment or combination of treatments is the acme of attainment. Each one of us must bring all the knowledge we have to bear upon each case. A careful study should be made of each case and all of the possibilities considered.

The subject of treatment is best considered by including hypertrophic atoxic goitre or simple colloid goitre, and thyroid enlargement common at the age of puberty, with that of toxic goitres.

HYPERTROPHIC ATOXIC GOITRES.

Much discussion of this subject has taken place. The use of iodine in minute doses has been recommended, and other drugs without number, but in my opinion, based on experience and upon the literature, surgery is the treatment of choice of non-toxic, long standing goitres. Certainly all goitres which are increasing in size, all which have not responded to small doses of iodide of potassium, one grain three times a day, all which are giving pressure symptoms, all which are the seat of tumors, should be removed. As one reason for removing all large goitres, Balfour's statistics may be quoted.

Cancer of the thyroid according to Balfour (19) occurred in 103 cases of 6,359 cases operated in the Mayo Clinics, with a mortality of six per cent. from operation, forty-seven and six tenths per cent. early recurrence, eleven per cent. are living, a total of sixty-five and six tenths per cent. This arbitrary view from an internist comes from the practical lack of mortality in operation of simple goitres, and the decided risk of toxic symptoms and malignancy in long standing simple goitres, as well as the decided uselessness of any medical treatment with which he is familiar.

GOITRES WHICH APPEAR AT PUBERTY.

These patients should be given either small doses of iodide or let alone, as in the experience of everyone those enlargements usually disappear as the person becomes older. Of course if the goitres become toxic or undergo changes which render them dangerous, they should be removed.

HYPERTHYROIDISM AND EXOPHTHALMIC GOITRES.

Four methods of treatment will be discussed: First, rest; second, röntgen ray; third, surgery; fourth, injection methods.

Means and Aub (6) have made some useful observations on the influence of the metabolism rate by single and combined treatments of the above methods. Their conclusions are: a, rest alone usually causes a marked decrease in toxicity; b, drugs in addition to rest do not materially accelerate the decrease of toxicity; c, the röntgen ray in some cases produces a decided improvement, while in others it has no effect; d, the usual immediate effect of surgery is a marked decrease of toxicity but there is a very definite tendency to recurrence.

Rest.—All patients with mild hyperthyroidism should at once be put upon rest treatment. This should as nearly as possible approach in detail the principles long since recommended by Weir Mitchell for neurasthenia. The patient must be away from home, in bed, in the hands of a competent nurse, and be given superalimentation. The treatment at home cannot be considered except as a makeshift. The father or mother cannot possibly separate themselves from their many worries when surrounded by familiar scenes and sounds. The ordinary medical ward must also be considered a makeshift, as pointed out by Alfred Stengel in a discussion at a recent meeting of the Medical Session of the College of Physicians of Philadelphia.

Many of the patients with beginning hyperthyroidism will respond to a properly conducted rest treatment, and will go on to complete cure. Re-

sponse occurs occasionally even with the makeshift trials.

The rest is particularly important in cases which occur as the apparent result of extreme fright, excitement and nervous strain. The removal of these apparent exciting causes in certain cases of Graves's disease will often be all that is necessary to bring about a cure. Rest is also imperative in the very toxic cases before thought of operation is entertained.

The following case is an example of what rest and change of surroundings will do.

CASE V.—Mrs. M. B., New York, on September 11, 1914, complained of diarrhea without assignable cause. There was no abnormality of the heart, blood vessels or thyroid. During March, 1915, she complained of cardiac palpitation and some tremor. The heart's action was tumultuous. There was no enlargement of the thyroid. The next week the tumultuous action of the heart with tremor of the hands was still present. During July, 1915, she had much less tremor and cardiac palpitation. For the first time, the enlargement of the thyroid was noticed. Before this the true character of the disease was not recognized. Her eyes were prominent. There was a tremor of the hands, fullness of the thyroid, which pulsated and was the seat of a to and fro murmur. The heart was enlarged to the left.

She was sent away from the family to Atlantic City and kept at rest, and belladonna was administered. In two months she was much improved. The neck had decreased four centimetres in circumference. Five months later (after seven months at the seaside) there was no cardiac palpitation, the pulse was 88 and she had gained twelve pounds in weight. There were no signs of the exophthalmos which was so prominent in July, 1915.

It will be seen that in this patient after the use of belladonna and her separation from all her former surroundings, all the symptoms disappeared. On January 5, 1920, her husband reported her as entirely well.

Of drugs, belladonna given in full doses to the physiological limit, bromide of potassium in ten to fifteen grain doses three times a day to quiet the patient, veronal at night the first few days to procure sleep, and morphine hypodermically in patients who are highly toxic, are helpful and often efficient. But the use of this method of rest and drugs must not be persisted in if the symptoms are not distinctly ameliorated after a period of observation, differing in each case. Surely surgery must be used if the patient does not improve in a few weeks. The patient should not be allowed to drag on in a condition of no improvement.

Charles Mayo repeatedly calls attention to the fact that the operation for toxic goitre is not an emergency one. We all know that the chief danger in surgery in hypothyroidism is in its employment in patients who are highly toxic. We are also aware that before surgery is employed in patients with very toxic goitres, the metabolism rate must be reduced by rest, drug treatment, and possibly by the use of the röntgen ray.

Without personal experience in the use of x ray,

but basing my opinion on the work of Pfahler, Pancoast and Manges, I believe that in selected cases of great toxicity, and in patients suitable for surgery, but who will not submit to this treatment, the röntgen ray will be of use if it is applied by an expert but it is highly dangerous if not applied according to well known safeguards. Not every man who runs an x ray machine is competent to treat toxic goitres, any more than every man who can wield a scalpel is competent to ligate the vessels or resect a thyroid gland affected by thyroid hyperactivity.

I am not a surgeon, and hence cannot give any direct advice as to how to do a thyroid operation. But being an internist I can have an opinion as to which operations have been of the greatest value to my patients. First as to the method of Crile in the use of anociassociation.

I have seen patients treated by the expert use of this method at the hands of Dr. Charles Frazier, have the thyroid resected or the vessels ligated and the patient leave the hospital without the knowledge that an operation had been performed. Surely a method which will relieve the patient of the worry, the fright, and the distress caused by the thought of an operation, is of the greatest value. It fails in the hands of many because the surgeon does not realize or carry out the necessary details.

In every severely toxic case, the patient must be given a thorough rest cure, with proper drugs, and perhaps the use of the x ray until the patient is as much improved as possible. Even ligation, as usually performed, is sometimes dangerous. I have seen severe exacerbation and occasionally death follow ligation.

The following technic is described by Charles Mayo (21) and is quoted as the best and usual method:

"Greater operative experience upon cases of hyperthyroidism has led to a great reduction in mortality. This has come about through many changes in the earlier operation, better operative technic, more careful preparation of the patients, choosing the operation to suit the case, and the graduated operation.

"*Operation.*—A transverse incision gives the best working space as well as the least disfiguring scar. It is made two and a half inches in length, crossing the central part of the thyroid cartilage. The incision should be made in a natural skin crease if possible, and should include the platysma myoides, this one incision being better than two lateral ones. The inner border of the sternomastoid is tracted laterally. This exposes the omohyoid muscle which is tracted up and in toward the midline. Beneath this muscle is the upper pole of the gland with the superior thyroid artery and vein.

"The ligating material is linen passed by an aneurysm needle. Should a vein be pierced and a hemorrhage follow the placing of the ligature, it is tracted upon and a second loop is passed around including more tissue."

There are certain patients who are so desperately ill that surgical intervention is full of danger, but where a delay seems certainly fatal. Dr. A. C. Wood has performed the operation of ligation un-

der such conditions with the result of great improvement, allowing later on a partial thyroidectomy and the cure of the patient.

I have had Dr. Wood put down his method. His note I quote in full:

"Assuming a condition of extreme thyroidism in which medical measures have failed to relieve the urgent symptoms, and in which it is necessary to promptly reduce the thyroid activity, the control in the circulation of the gland suggests itself as one of the most promising measures. This can be accomplished by ligating one or more of the four principal arteries supplying the gland. It is usually advisable to tie one or both superior thyroid vessels, as they are more accessible. The operation is a simple one, and may easily be done with local anesthesia. A two inch incision along the anterior border of the sternocleidomastoid muscle, through skin and platysma, exposes the muscle. The deep fascia is incised in the same line, the sternomastoid gently retracted outward, which exposes the sheath of the great vessels. The sheath is opened and the vessel sought is readily found just above the bifurcation of the common carotid artery. The ligature should be of thread rather than of catgut.

"In many cases not a single vessel is divided that needs a ligature, and it is rarely necessary to tie more than one or two bleeding points. No drainage is required.

"This technic may be carried out without the least trauma or interference with the thyroid gland, without any general anesthesia, and hence without adding any additional burden to the load the patient is already struggling with. If both vessels have been tied, the blood supply to the gland has been reduced by half. In the most extreme cases, it may be desirable to ligate but one vessel at a time."

So many modifications of the original suggestion of arresting a part of the blood supply to the gland have been made and carried out, that one reading the literature might be in doubt as to just what is intended by the term ligation.

The following case illustrates the extreme illness of some of these patients, in which any increase of metabolism would seem to be quickly fatal, and in which the method of ligation employed by Wood is highly advantageous. It is just such cases or even less dangerous ones in which x ray may be used.

CASE VI.—Mrs. C., aged thirty-five. Seen with Dr. W., Hightstown, N. J., July 18, 1919. For many years she had recognized a goitre which had given her no trouble except from its appearance and size. There was no pulsation inherent in the gland and there was no murmur except as transmitted. Marked exophthalmos, was present; the pulse was 135; heart dilated and a murmur over the body of the heart; blood pressure 160 and 80. Seen December, 1915, there was distinct loss of health, dyspnea, pulsation of the vessels, and palpitation of the heart. On July 14, 1918, there was sudden severe vomiting, diarrhea and rapid emaciation. The patient seemed at death's door. She was put on more strict rules of rest, a nurse was obtained, but the symptoms gradually increased in severity. At the end of this period, Dr. Wood tied both superior thyroid arteries with almost imme-

diate improvement. In six months there was a return of the symptoms of hyperthyroidism. The right lobe and isthmus were removed. Since then the patient has regained her health.

As to the question of choice between ligation and resection. The rule that seems best is first ligation of one or both arteries in every severe case, then ligation of the pole, then a partial resection. It is better to do too little than too much. A second operation can be done. A patient cannot be recalled from the grave.

INJECTION METHODS.

I have not had experience with these methods, but with access to certain methods of surgery, injection seems cumbersome and uncertain. The following succinct plan may be followed in treating hyperthyroidism with the minimum of fatality:

First. An early diagnosis is imperative by the methods here detailed.

Second. Every patient should be put to rest in order to reduce the metabolism rate. Many patients will be cured by this means.

Third. Patients who cannot give the time to a thorough trial of rest should be operated upon early, after a partial rest.

Fourth. Patients who are very toxic must always be put at rest and given other appropriate treatment before any form of surgery is attempted.

Fifth. If patients fail to improve under rest, ligation should be done, or the röntgen ray should be used tentatively to reduce the metabolism rate, until a resection can be done.

Sixth. In very severe cases in which the patients appear to be approaching death, and the x ray cannot be used, a ligation after the method of Wood may be done.

The writer thoroughly believes that in patients who do not promptly respond to rest, surgery by all odds is the proper procedure.

INDUSTRIAL MEDICINE.*

Its Proper Relation to Industry.

By S. DANA HUBBARD, M. D.
New York.

Fundamentally, the science of medicine is applicable to industry, for its principles may be applied to the selection and assignment of applicants for work, to the supervision of laborers when at work, that they may produce with greatest effectiveness and with least harm to the individual worker. Labor may be controlled scientifically; the principles of the prevention of accidents and of illnesses may be practically applied, so that production may not be diminished by injury unnecessarily inflicted upon workers or these laborers made ill and unable to work, thereby causing loss of time, waste of material in the raw product and unnecessary expense to the producer.

Industrial medicine in practical application must naturally be a compromise between the ideal and the commonplace, the medical ideal being that medical service in industry to be of the greatest possible usefulness must primarily benefit the worker and

through increased capacity, ability and usefulness react to the benefit of industry and through these to public health. The policy of good management is to assist workers to the greatest possible degree of production, and to do this successfully workers must be selected, assigned, tried out, intensively trained, and compared so that those best suited may be employed. Once employed their work should be supervised in order that they may continue to perform the maximum of work with the least possible wear, much the same as does the machine when properly adjusted and working at its highest efficiency under intelligent supervision.

THE DUTY OF EMPLOYER TO HIS EMPLOYEES.

Generally speaking, it is the duty of the management to provide for the worker the following essentials: 1, A safe, healthy place in which to work and which is kept clean and well ventilated; 2, tools, machinery, and methods which permit of rapid work of good quality; 3, careful, competent and helpful supervision; 4, if work is monotonous, exhausting, or requires concentration, time for rest and recreation; 5, opportunities for education and advancement; 6, fair and adequate wages with regular payments; 7, medical and nursing supervision, with instruction on how to keep well and avoid injuries; 8, special facilities for training inexperienced workmen; 9, reduction of all hazards to the minimum; 10, encouragement of thrift, domesticity, morality, and sobriety. The fulfillment of these duties makes employers expect that their workers will be healthier, happier, their services more stable, and production at the maximum of capacity. These results are beneficial to the worker, to the manufacturer and to the public.

THE DUTY OF THE EMPLOYEE TOWARDS HIS EMPLOYER

1, That he shall be interested and enthusiastic about his job; 2, that he shall be loyal to his work and exert every possible effort to have others so; 3, that he shall give a full day's labor for a day's pay; 4, that he shall conserve material, prevent waste, be honest, and play fair; 5, that he shall report dangers of all kinds, whether it is his duty or the duty of another; 6, that he shall take due precaution to aid his fellow worker and prevent sickness or accident; 7, that he shall willingly and cheerfully cooperate best to serve his employer and aid his fellow workers.

HEALTH AND INDUSTRY.

Employers are beginning to realize that the subject of health vitally concerns their industrial problems. Industrial medical and surgical supervision of work is essential in order to produce efficiently, as capacity depends probably more largely on the physical and mental condition of the workmen than on any one single factor. To reduce hazards, especially those which occasion illness or injury, requires medical attention. If we are to secure and maintain high efficiency in a working force both health and safety must receive necessary and proper consideration.

The first step in the conservation of energy and health is to learn the facts of the physical condition of the workmen. False modesty and sham must be turned aside and those industrially employed taught

*Read before the Academy of Pathological Science, New York, April 23, 1920.

how to live good clean lives, employers must be taught the error of overdriving workers to the point of exhaustion, the public made to stop exploiting labor, and profiteering eliminated.

THE FACTOR OF PREVENTION AND EDUCATION.

Individual plants often have accidents which cost both money and lives. Many of these manufacturers are indifferent because they are protected from loss by insurance. The man who is ignorant of the cause of these conditions thinks that by posting bulletins he may remove the cause. He hopes that people will remember his words and their safety but he permits the hazards to remain instead of accepting the principle, "Conditions shall be such that workmen may pursue safely their normal activities without abnormal care." There is no use talking in high brow phrases and then neglecting essentials. The wise and prudent man knows what are the prolific causes of both sickness and accident and governs his actions accordingly. Workmen are, as a rule, unaware of these and it is necessary that they be apprised by repeated cautioning, by careful education and by proper protection.

THE INDUSTRIAL MEDICAL OFFICER.

To reiterate, medical aid almost specifically concerns industry. It is not sufficient simply to have a dispensary in the plant with hours for advising or treating such employees as may from time to time need medical advice, or to have first aid applied. Industrial medicine demands not only a knowledge of the human body, a knowledge of the conditions which impair it, as well as the means for restoration when impaired, but also the more necessary measures that will enable workmen to reach and maintain their greatest capacities for good work. The ability of medical officers to participate in this plan establishes the logical relation of medicine to industry.

Since the value of medical service will be measured by its effect on production, the most useful industrial medical departments are those best able to avoid accident and prevent absence incident to illness which means, loss of time, unnecessary expense to both management and worker, as well as increased labor turnover, diminished production, and in frequent instances waste of material. The human element must be known and evaluated. The long way is the safe way, but it is the short way which usually is taken and is the dangerous way because human nature loves to take a chance. Managements and labor both seem today to object to the long way. If time is so essential a factor that the long way must be sacrificed, how can labor be speeded up without actually occasioning a breakdown or heating up of the human mechanism?

This is the problem of the medical officer of the plant. A man applies for the position of watchman. This applicant has flat feet, but no physical examination is made and so every one, even the applicant himself, is unaware of the defect. In time, however, he finds walking painful and instead of walking and watching, he sits and eases himself, neglecting his duty, and giving opportunity for depredation by thieves with attending loss of property. This is the forbidden way and the inevitable happens. The workman's neglect is discovered and he is discharged,

which is like locking the stable door after the horse has been stolen. Had the defect been remedied in the first place a man would not have lost his job, labor turnover would have been reduced, and property would not have been lost. Is not this contributory negligence on the part of the management? Can such management be considered efficient? To ascertain the presence of defects, in order that employment departments may know the limitations of employees, is a true function of the industrial medical officer.

Monotonous, concentrative or exhausting operations are known to be hazardous to health. Who appreciates this better than does the medical officer, and who is there to detect this physical stress and resulting inefficiency better than the plant physician? If no physician is employed or if one is employed who does not appreciate his position, there is none to aid the management in stopping this costly leak to production.

The plant physician comes into intimate contact with almost every branch of the industry, more especially with the employment office and the divisions of medicine, safety and welfare. If the plant physician is efficient, he fulfills the various demands made upon him. He needs must know intimately and well the workings of each branch of the plant and by making physical examinations and periodical reexaminations of the workers, and supervising the sanitation of the plant, he can exert a direct influence upon the essential elements of production. If he examines applicants for employment he uses the knowledge obtained for proper placement with regard to capacity and fitness. The perfect man is not to be found, but with medical guidance the man with defects may be guided and directed so that he may serve most efficiently and with the least harm to himself. The plant physician attending accident cases and investigating the causes leading up to them is in a position to recommend measures to prevent the repetition of such incidents.

If the plant physician has the proper idea of medical supervision of industry, he attends the sick workmen at their homes and becomes familiar with their domestic and community problems. He knows whether this workman or that is spending his earnings wisely; whether this man is rearing his family so as to be an asset to the community; which one is thrifty and is looking ahead and preparing for the proverbial rainy day, or whether in a more or less short time another liability will be thrust upon society. Through the careful plant physician the problem of communicable diseases may be studied and their introduction into the plant, with the ensuing disastrous effects upon production, loss of time, and waste of material, may be prevented.

By proper use of the plant physician, the worker is adapted to his job, accidents are prevented, sickness is diminished, absence reduced, labor turnover minimized and the workman made to feel that there is some one influential with the management interested in his personal welfare. This raises morale and increases interest in the work. A full knowledge of the physical and temperamental limitations of the worker is of much assistance to managements and in all instances of direct benefit

to the worker himself. Does the ordinary plant apply this knowledge to the aid of production? Only in exceptional instances is this done. Why? Has not the misuse of the physician as an eliminator of bad material or improper use of the plant physician made labor distrustful of a service that when properly used is labor's greatest aid to efficiency and health? No doubt the contract doctor with his limitation of service and abilities has also had a bad if not actually a vicious influence which has resulted in much misinformation regarding industrial medical service.

The modern industrial physician knows under what conditions people may engage in hazardous occupations and what precautions are essential to both safety and health. He instructs his aids, drills his staff, and informs his workers so that when danger appears or accidents occur the medical service is prepared and acts promptly. Industrial physicians meet many opportunities to clear up differences between employer and employee and even among employees themselves. By successfully availing themselves of the opportunities afforded by a modern industrial medical service, managements know intimately the physical limitations of their industrial staff. Without this information some are overworked and others are underworked.

NECESSITY FOR MEDICAL GUIDANCE IN INDUSTRY.

Statistics regarding health in industry are replete with interesting correlating facts. From the United States Department of Labor we learn that there are about forty million people engaged in industry. Of this army of workmen there are about 750,000 who sustain accidents which disable them for a period of more than four weeks' duration. There are about 22,500 industrial workers killed annually, and between 15,000 and 18,000 who suffer permanent disability. The economic waste from these accidents means the loss of working time of over 60,000 laborers or 18,000,000 work days a year.

Sickness in industry likewise exacts a heavy toll. We are informed from the same source that the average worker loses about nine days a year. This means a loss of one million workers a year or 360,000,000 days a year, both of which estimated at an average per diem wage means a stupendous amount in dollars and cents. This is the loss simply from sickness and accident: to this there must be added the loss of production, the cost of medical and nursing service and medical supplies, and sundry expenses which make a sum running into the billions. There is no greater problem before the country today than that of caring for the industrial worker. There is no one in this country who can better cope with this situation than the properly trained and equipped industrial physician.

AIMS OF INDUSTRIAL MEDICINE.

1. Devising ways and means of improving the health of workmen; 2, preventing losses to employers due to the poor health of employees; 3, preventing losses to employees due to their own poor health; 4, demonstrating the advantages of health supervision; 5, preventing sickness, accidents, and deaths incident to poor health; 6, removing hazards which occasion poor health or cause injuries to workmen.

APPLICATION OF INDUSTRIAL MEDICAL SUPERVISION.

1. Plan a daily program so that there will be a healthful balance between work and outdoor activities; 2, develop habits of cleanliness in person, food, dress and environment; 3, instruction so that there will be intelligent cooperation, hygienic rules carried out willingly, at work, in the home, and in the community; 4, education as to the necessity of appreciating early signs of illness and of seeking medical assistance; 5, preserving eyesight, demonstrating proper and improper lighting, avoidance of glare and direct light ray irritation, protective devices; 6, teaching the employed what is a suitable and well balanced diet; advice concerning luncheons, and meals generally; meeting the physical needs of diet; 7, avoidance of exposure to heat or cold, getting wet, chilled, cooling off too rapidly, dressing to meet weather conditions; 8, cleanliness, necessity of clean clothing, clean and safe work garments, bathing, washing hands, clean habits; necessity for cleanliness about children to avoid sickness in the home and escape the stress and strain of home worries; 9, vermin, the cause, the dangers; characters of vermin and destruction of such pests; 10, precautions to be observed regarding the communicable diseases; 11, necessity for rest, recreation, days of rest, taking time to eat and resting after meals; amount of sleep required; signs of fatigue, of debility, loss of flesh, and too early advancing age; 12, avoidance of excesses, what constitute excesses; dangers of over indulgence in sweets, tea or coffee, drinks, excessive smoking, late hours; 13, necessity for the use of safe, strong, suitable tools, ladders and protecting devices; 14, keeping articles out of the mouth; necessity for keeping fingers out of ears, nose, mouth, etc.; 15, necessity for safe and sane habits about shop; the need for looking out not only for self but exercising consideration for others in regard to yards, toilets, sinks, urinals; keeping aisles clear and unobstructed.

Industrial strength equals the sum of individual physical efficiency. Every person employed in an industrial plant is a determining factor in the strength and efficiency of production. Success is not determined by the brains and physical energy of the management but by the earnest zealous enthusiasm of every individual employed in the works. The field therefore of industrial medicine is limitless. Enthusiasm for the job depends upon proper adaptation of man to work and the participation of that man in the requirements of his work.

There must be working enthusiasm—there must be a desire for health—if there is it will do much to give the worker strength, virility, and above all a reason to live. No factor in living is so important as health.

Actually to enjoy life, we must be free from the burden of poverty and sickness as well as free from the fear of future want and be able to appreciate the present good. The problem of industrial medicine is how can we make men eager to work and eager to live. We must teach them how to take proper care of themselves and make the most of their opportunities. Brains are paid for and command a ready market.

143 WEST 103D STREET.

THE CONDITION OF THE CHEST IN INFLUENZA.*

Surgical Aspect.

By L. J. HAMMOND, M. D.
Philadelphia.

The surgical phase of postinfluenzal chest conditions lends itself mainly to a discussion of thoracic effusions. These are primary in only a limited number of instances, the vast majority of them being secondary, occurring either as part of the clinical picture of some general infection, such as was so commonly met with during the epidemic, or an extension of local processes in neighboring organs, especially those affecting the lungs. And yet, while secondary, the physiological conditions that exist in the thoracic cavity are such that an independent clinical picture is produced by the effusion, requiring special treatment not independent of, but in conjunction with, the medical treatment. The effusions that occurred during the epidemic of 1918 were exceptional only in that they were, more often than is usual, sudden in occurrence and massive in quantity, and associated frequently with extensive effusion into other serous cavities.

The more usual occurrence of these effusions is late, during the period of recovery from inflammatory disease of other organs. All pathological effusions demand special treatment independent of the primary disease, hence it becomes at once of special surgical interest. The effusions differ greatly both as to extent and characteristics and may be anything from a mere transudate, a clear serous exudate, a cloudy exudate, on through transitions to pure pus, serohemorrhagic fluid, pure blood and chyle. The mere presence of effusions in sufficient quantity causes disturbance of respiration and circulation proportionate to the quantity, and the systemic disturbance is directly dependent on the virulence of its toxicity by absorption of the invading organisms. Not all serous effusions, however, have toxicity. Even during the epidemic pyogenic organisms were absent in fluid that was early aspirated. In consequence, then, of the mechanical factor and the toxic possibilities the symptoms must be considered as arising from two causes, first, those of a purely mechanical disturbance and, second, those from the absorption of toxicity. Owing to the limited space, sudden and massive serous effusions without the presence of pyogenic organisms may so affect the neighboring organs as to necessitate immediate evacuation, at least in part, for the relief of pressure. The changes produced by these effusions affect, first the chest wall, then the lungs, then the organs in the mediastinum, and finally the abdominal organs. Early in the streptococci form of infection the pleura presents on its surface a granular or strawberry appearance, which is not met with in the pleura where the effusion is from less virulent types of organism. In the latter the condition is often more chronic and the pleura is found to be dense, presenting the appearance of fibrous membrane.

In massive effusions the involved chest wall be-

comes distended, the sternum may be pulled over to the affected side, and the lung, if not bound by previous adhesions to the parietal pleura, is forced inward and rests against the side of the vertebra. The respiratory cycle is seriously interfered with both by reason of pressure against the lung and downward displacement of the diaphragm. The displacement and pressure on the heart is often marked and always serious and the viscera in the mediastinum—esophagus, descending aorta, the pulmonary vessels and the vena cava—are pressed down and embarrass respiration and circulation in proportion to the massiveness of the effusions.

The unaffected lung is compelled to perform the work of both though seldom itself entirely free in action. The classic picture, therefore, of marked dyspnea, cyanosis, and feeble rapid pulse is readily accounted for by the mechanical interference; the heart is overworked and death may ensue merely from change of position from the recumbent to erect or sitting posture. The depression of the displaced vena cava or the large vessels arising from the heart prevents the blood entering the heart and indirectly the brain, causing syncopal attacks. Then, too, there is difficulty in swallowing from compression of the esophagus.

While symptomatology in detail belongs to the realm of physical diagnosis, certain disturbances in the physiological performance of the anatomical structure in the thorax cause clinical signs and symptoms so definite that they must be considered equally from a surgical viewpoint. These are dullness over the affected area, displacement of the heart, absence of respiratory signs, and vocal fremitus. When there are no adhesions to prevent it, a large amount of effusion separates the lung from the chest wall. When such do exist multiple pockets and irregular compression of the lung are found. Some of these pockets may contain pure serum, others pus, and others serohemorrhagic fluid. Such complications as these offer difficulties both in diagnosis and surgical treatment. The effusions which occurred during the epidemic were usually treated before changes in the pleura could take place. These changes, such as thickening and contracture, which often pull together and diminish the circumference of the thoracic wall, are often encountered in old effusions.

The variety and characteristics of the pathological effusions that occurred during the epidemic differed only in their suddenness and massiveness and great toxicity, the *Streptococcus hemolyticus* furnishing the gravest constitutional disturbances because it produced the most sudden and overwhelming effusions. They were all, however, secondary to general streptococcal infection, influenzal pneumonia, and similar conditions, and, in a few instances, I believed them due to hemorrhagic infarcts the result of a general systemic bacteremia.

There seems to have arisen a diversity of opinions as to the best surgical treatment of pleural effusions, growing out of the findings of the various empyema commissions. At the beginning of the epidemic the effusion was so sudden and massive as to prove fatal before any operative treatment could be employed. Later on early rib resection was practised with an

*Presented before the South Branch of the Philadelphia County Medical Society, April 30, 1920.

eighty per cent. mortality; still later, delayed operation with early aspiration was practised with a further improvement in lowering the mortality, though it was still high, while further along in the course of the epidemic all operative treatment was delayed with a yet greater number of recoveries. Therefore, if one examines these findings of the commissions at the several military camps and studies the voluminous literature, he is disposed to conclude that the particular operative procedure played a less important part in the reduction of the mortality than the spent virulence of the toxic process, because, as the epidemic drew to a close, delayed thoracotomy with or without rib resection, with or without irrigation, resulted in a percentage of recoveries equal to that in civil practice and before the occurrence of the epidemic.

The report clearly suggests the wisdom of returning to the fundamental rule in the treatment of pyothorax, that is, to remove the pus as soon as its presence can be determined, for effusion is seldom, if ever, purulent early; then secure and maintain adequate drainage from the most dependent part of the abscess as long as suppuration persists. Thoracotomy with or without rib resection is the method of choice.

The addition of irrigation has not been proved valuable since a much larger number of patients so treated have been and are actually now requiring some form of collapsing operation and decortication because of the extensive adhesions that appear to have been directly caused by its use. Therefore, neither the influenza epidemic nor the empyema commission has disproved the merits of the fundamental rule that governs the operative procedure in thoracic effusion before their occurrence, viz., paracentesis, either with or without suction drainage, when serothorax is so massive as to affect by its mere mechanical presence the physiological functions of the organs in the thoracic cavity, and thoracotomy, should be performed, with or without rib resection for pyothorax as soon as its presence can be determined.

Rib resection is generally necessary when there are marked narrowing of the intercostal spaces and pleural adhesions with pockets; otherwise most uncomplicated abscesses require only intercostal incision and drainage. For the relief of pain analgesia with novocaine or ethyl chloride is usually all sufficient. Inhalation anesthesia is seldom needed and always an added danger. Not rarely during the epidemic there were instances where both a serothorax and a pyothorax became infected with mixed pyogenic organisms resulting in gangrene of the lung and osteomyelitis of the ribs. These were fatal in most cases.

When the empyema is encapsulated the x ray will best determine the most dependent point of the abscess. In all other instances the eighth or ninth interspace external to the long muscles of the back is found the favorite site. Chest and arm exercises intelligently directed are always included in the convalescent treatment in all these cases and the results are beneficial.

1222 SPRUCE STREET.

ABDOMINAL SYMPTOMS IN INFLUENZA SIMULATING AN ACUTE SURGICAL LESION.*

By THOMAS HUBBARD RUSSELL, M. D.
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My interest in this subject was aroused by the fact that I have personally seen five cases of influenza presenting pronounced abdominal symptoms, sufficient in every case to have caused the possibility of an acute surgical lesion in the abdomen to have been entertained. The first patient diagnosed her own condition as appendicitis, on account of the severity and predominance of the abdominal pain, and came to me for an operation. Three of the patients I saw in consultation with Dr. Standish and Dr. Seabury, of New Haven, and Dr. Perrins, a naval surgeon stationed in New Haven during the war. The fifth patient I saw in the New Haven Hospital by courtesy of Dr. Blumer and Dr. Tileston, on whose service it occurred. All of these cases were in adults, and all of the patients recovered uneventfully without an operation. I hope to report the cases in greater detail at some future time. This paper does not permit of it at present.

The subject I believe to be of considerable importance at the present time on account of the seriousness of the recent epidemic, and the probability of our seeing sporadic cases for some time to come, and also on account of the frequency of abdominal symptoms, and the great difficulty so often encountered in arriving at a correct estimate of their true significance, as well as the danger of an unnecessary operation during the course of an influenza. It is now possible to formulate, on the basis of the available literature, an accurate estimate of their meaning.

We must depend principally on the literature embodied in the periodicals printed during the past two years, for two reasons. In the first place, the character of the cases encountered in the epidemic of 1888-1889 varied somewhat from those found in the recent epidemics. In the former epidemic, people of all ages having been almost equally affected, and a relatively large number having had the gastrointestinal form, characterized by nausea, vomiting, diarrhea, and hemorrhages into the intestinal tract, which have been rare in the recent epidemic. Also the acute surgical abdomen and particularly the pathology of appendicitis were not nearly as well known at that time as they are now. One does, however, find references to typhlitis in the literature of that time. Articles on influenza in the standard textbooks of today give scant or no attention whatever to the symptoms and signs frequently occurring in influenza, which would ordinarily suggest an acute surgical abdomen.

The abdominal lesion most often simulated is appendicitis, and a differential diagnosis here is made more difficult by the fact that the two conditions, at least during the recent epidemic, have occurred most frequently at the same time of life, young adults having been chiefly affected. One must, of course, always consider the possibility of a coexistence of the

*Read before the Connecticut State Medical Society, May 19, 1920.

two conditions. It would be strange indeed if they did not occasionally coexist.

Let us consider for a moment what lesions are known to occur in the abdomen secondarily to influenza. One of the most frequent is peritonitis, which may be either local or general. When local it occurs most frequently in the upper abdomen, adjacent to the diaphragm. In a large proportion of these cases it appears to be a direct extension from an adjacent empyema. When general it usually is of a fibrinous character. When purulent it is, as a rule, part of a general pyemic infection. It is not due to an extension from an infection of the appendix or gallbladder. In some cases a localized collection of serosanguinous fluid is found among the coils of intestine. The causative organism may be the *Streptococcus hemolyticus*, pneumococcus or staphylococcus. Where peritonitis is a complication, it almost always comes on during convalescence from pneumonia.

Rupture of the rectus abdominis muscle has frequently occurred during the recent epidemic, and still more frequently during the epidemic of 1888-1889. It occurs in muscles showing a Zenker's degeneration, probably due to a spasmodic contraction of the weakened muscle during coughing. It may result in a hemorrhage within the sheath of the muscle, which not infrequently becomes secondarily infected, resulting in a deep abscess. The rupture is rarely complete, and usually occurs midway between the symphysis pubis and umbilicus. One writer reports eight cases, another has seen twenty. These patients have frequently been operated upon for a supposed appendicitis.

Multiple abscesses of the kidney, and perinephritic abscesses occur infrequently.* A thrombophlebitis of the large abdominal vessels has occasionally been reported. Also a general congestion of the intestines, with submucous hemorrhages, occasionally occurs. One case of rupture of the colon has been reported.

These lesions are about the only ones at all likely to appear in the abdomen. In the great majority of cases they have come on during convalescence, or as a terminal process, and an operation would have been useless, or merely hastened the end.

There are a few who believe that there is a close relationship between appendicitis and influenza, but their statistics are not convincing. The general opinion seems to be, on the contrary, that appendicitis is a very rare complication, although a train of symptoms which would ordinarily substantiate such a diagnosis is exceedingly common. The best statistics available are from the military camps and base hospitals, as here tremendous numbers of men suffering from influenza were under observation and excellent control. Let me quote freely from a few of those which describe the frequency and the puzzling nature of the abdominal symptoms.

Camp Dix.—During the twenty-two days of the epidemic there were 6,000 cases of influenza in the hospital, and 800 deaths due to the epidemic. Synott and Clark report: "In the abdomen, meteorism occurred in some cases; in certain lethal cases it was excessive. Abdominal pain and tenderness were

present, possibly not entirely due to pleurisy, but in the light of necropsy findings to infection and hemorrhages in the rectus muscles."

Camp Logan.—A daily average of 24,000 men were in camp and 4,126 were admitted to the hospital with a diagnosis of influenza in addition to 567 with a diagnosis of pneumonia. The report states: "An interesting feature of the respiratory epidemic was the great number of patients admitted to the hospital with a diagnosis of acute appendicitis, in whom, after a few hours of observation, we changed the diagnosis to either influenza or pneumonia. About fifty cases were received whose previous diagnosis was wrongly given as appendicitis."

U. S. Naval Hospitals in Philadelphia.—Daland reports on the basis of 3,000 cases of influenza: "Reflex pleuritic pains have been erroneously diagnosed as cholecystitis or appendicitis—usually interlobar and diaphragmatic seroplastic and purulent pleurisy are not diagnosed, but the latter may be suspected when friction sounds are heard over the borders of the lung or when referred pain occurs in the upper abdominal, gallbladder or appendix regions. . . . Autopsies showed no pronounced gastrointestinal pathological change. . . . Referred pleuritic pain is often mistaken for cholecystitis or appendicitis." Billings states: "In the majority of instances there was some abdominal distension and pain on palpation, particularly in the right iliac fossa. This latter symptom cleared up rapidly, however, but during its presence markedly simulated appendicitis."

Great Lakes Naval Training Station.—McNally reports that he saw a considerable number of cases which taxed his diagnostic ability and that of his colleagues on the surgical service. He states: "The onset of acute chest conditions gave us concern in many instances. They were confused most often with acute appendicitis although we were occasionally confronted with symptoms resembling acute gallbladder disease. I have come to have a wholesome respect for the difficulties encountered in making an early diagnosis in these cases." Autopsy findings showed in some cases a moderate amount of turbid liquid in the peritoneal cavity, but the appendix and gallbladder showed no changes which could be connected with the recent condition. "To have operated upon these cases would have been a fatal mistake."

Royal Naval Hospital, Plymouth.—Smith reports: "In the earlier days patients were constantly being sent in to the surgical service with the diagnosis of perforated gastric or duodenal ulcer, less frequently as an acute appendicitis—the true diagnosis is often difficult."

Camp Dodge.—Manson reports that at one time there were a total of 8,000 cases in the hospital. The total number diagnosed as influenza from September 16 to December 15, 1918, was 10,041. He states: "In about thirty patients with pneumonia symptoms developed strongly suggestive of surgical lesions of the abdomen, which were seen in consultation with the medical service; so closely did some of these cases with chest pathology simulate appendicitis that three of the patients were transferred to the surgical wards with the diagnosis of appendicitis, but the true

condition was discovered in time, and none of them were operated upon. There were two patients with appendicitis who were operated upon, and gangrenous appendicitis was found, each patient giving a history of previous attacks of appendicitis."

University of Iowa R. O. T. C.—Rowan states that among 1,030 cases of influenza, appendicitis was not a common complication, there having been two cases. In quite a number of patients there were pain, tenderness and rigidity, localized in the right lower abdominal quadrant. He states: "This was marked enough in some cases to have led to the diagnosis of acute appendicitis and to have indicated operation in ordinary times." He felt that it was extremely important to avoid unnecessary operations in these influenza cases.

Camp Zachary Taylor.—Meyer states: "In many instances patients were sent to the surgical department, in whom the condition was diagnosed as appendicitis because of the history of abdominal pain and vomiting."

Camp Custer.—Beals and others state: "A number of patients were either admitted to the surgical wards or seen in consultation in the medical wards for pain in the right lower quadrant. Pain of a dull, aching character, referred to the right lower quadrant was the most prominent feature. . . . These abdominal signs and symptoms might ordinarily be diagnosed as appendicitis. However, it was repeatedly observed that the local abdominal signs disappeared in a short time; more rarely they persisted and increased in severity so that operation was deemed imperative. This group occurred in influenza patients, nearly all of whom later showed demonstrable signs of bronchopneumonia." Four and two tenths per cent of the cases coming to autopsy showed peritonitis, usually localized in the upper abdomen, and never secondary to any demonstrable abdominal lesion. Abdominal rigidity and tenderness of the upper abdomen were usually a reflex from pneumonia.

Camp Lewis.—Based on their experience with 7,088 cases of influenza and 1,126 cases of bronchopneumonia, Kerr and others state: "While abdominal symptoms have been rather infrequent during the course of the disease, they are, when present, the source of great annoyance. In two instances these symptoms led to operative procedures. At operation one patient was found to have a normal appendix and pneumonia developed later. The other presented an acute gangrenous appendicitis, although the leucocyte count prior to operation was 6,000. Pneumonia was not found in either case prior to operation. In another instance abdominal pain, leucocytosis and a slight jaundice suggested acute cholecystitis. Pneumonia with a resulting empyema on the right side was found and apparently produced the abdominal picture."

Camp Beauregard.—Frick reports that many patients "had vomiting; some became tender over the abdomen, imitating an intraabdominal condition."

Abrahams, Hallows and French report that in several thousand cases of influenza occurring in the British army, about 400 of which came to autopsy "Abdominal pain . . . has existed of sufficiently

severe character to lead to a provisional diagnosis of appendicitis, and even to some solicitude as to a differentiation from an acute abdominal condition urgently needing operation." Under postmortem findings, they state: "The vermiform appendix has not shown any noticeable change. We mention this because there has been a tendency elsewhere, we have been told, for certain of these influenzopneumonic patients to develop acute appendicitis."

Brooks and Gillette state that out of about 29,000 deaths in the American Expeditionary Force due to influenza only three were recorded as due to other conditions than pneumonia. Dr. Lewis Connor states on the strength of a study of reports to the surgeon general from seventy-two base hospitals scattered throughout the country: "Abdominal pain was of rare occurrence. Abdominal tenderness was sometimes encountered, but seemed usually to be either a part of a general hyperesthesia or related to inflammation in the chest which involved the diaphragmatic pleura. Very rarely it was caused by a local or general peritonitis."

Henderson and Billington, basing their statements on an experience with about 5,000 cases of influenza in a large base hospital, say: "In some cases the abdominal signs and symptoms are such as to strongly suggest an acute appendicitis, and quite a number of cases have been operated upon on this diagnosis. On the other hand, during the latter part of the epidemic, numbers of patients were sent into the hospital with a provisional diagnosis of influenza of the abdominal type, in which the condition was actually one of acute appendicitis. In one week we had three such cases in which operation was necessary. One does not regard influenza in an ordinary sense as a cause of appendicitis, but it can be readily understood that, with such a catarrhal condition of the bowel as is often met with in abdominal influenza, an acute appendix inflammation may be readily set up."

Mann, from his experience at a base hospital, states that the abdominal symptoms were frequent, might occur before other symptoms, and frequently lead to a diagnosis of appendicitis; that true appendicitis in influenza was rare, but did occasionally occur. "Acute appendicitis was so rare that we had only one case. . . . The cases simulating appendicitis gave us a great deal of anxiety."

That the abdominal symptoms are not confined to military practice, and that cases are not infrequently operated upon for a supposed abdominal lesion in civilian life is illustrated by the following abstract and quotations: Bloomfield and Harrod state from their experience at the Johns Hopkins Hospital: "In a few instances, acute abdominal pain, vomiting, or diarrhea, ushered in the disease."

William R. Williams states: "Another group of cases showed chiefly abdominal symptoms. . . . One such patient was admitted to the New York Hospital with fever and a good history of acute appendicitis. The abdomen was rigid and sensitive in the region of the appendix. Because she had a little cough and influenza was so prevalent at the time, operation was delayed for a little time. Later there developed a double bronchopneumonia, and the patient recovered

without surgical treatment. There were other patients who had both an operation and pneumonia to get over. . . . Another patient was operated upon for acute cholecystitis. The gallbladder was normal and later pneumonia developed."

Dubs operated upon two patients with supposedly ruptured appendix during influenza. In both cases no surgical condition was found, and no real lesion of the appendix, but a slight congestion of this region. In other cases he states that individuals have lain in the hospital for twenty-four hours with a diagnosis of abdominal grippe, and the patients were then operated upon and a ruptured appendix located.

Manges states: "Another symptom referable to the abdomen is pain. At times this may be so severe that acute abdominal conditions may be suspected. In the case of a child recently admitted to the Mt. Sinai Hospital, the abdominal pain was so severe and cramplike and the rigidity of the abdomen was so great, that in the presence of fever, and the absence of other symptoms and signs, a diagnosis of acute appendicitis was made. As nothing was found at the operation, the true diagnosis of influenza became apparent. I have seen a number of patients in my own service in whom the main symptom was intense abdominal pain, which was especially referred to the epigastrium."

Delbet has described two patients in his private practice in whom there were all the symptoms ordinarily found in an appendicitis with abscess formation, including a palpable mass. The first was operated upon and died, the appendix having been found normal, but there having been a collection of serosanguinous fluid between the loops of intestines. In the second case, profiting by his experience in the first, he did not operate, but used medical treatment, especially antistreptococcic serum, with rapid improvement and restoration to health. In both of these cases the abdominal symptoms developed during convalescence from influenza. He is firmly convinced that these patients should be treated medically, and that it is poor judgment to operate. He makes the suggestion that the streptococci are carried through the intestinal wall by the lymphatics of Peyer's patches. He states that one must be on the lookout for these cases during convalescence from the grippe.

Reissman states: "Pain and tenderness in the right iliac fossa suggesting appendicitis were noted in several instances, but in my personal experience none of these cases were appendicitis; virtually all were examples of pain referred from the chest."

Villard has reported four cases of influenza closely simulating appendicitis, two of which were referred for an operation. All recovered within a few days without operation. He states that the most important part of the treatment is to abstain from operation, which is very dangerous, and treat the patient with an ice cap and enemas.

From a thorough examination of the literature, at least since the recent epidemic, and from my own limited experience there is, I believe, sufficient evidence to warrant the statement that the complication of surgical appendicitis or cholecystitis or any other

surgical lesion within the abdomen requiring operation is very infrequent, but that abdominal pain and tenderness are extremely frequent, and are in the majority of cases either reflex, when present in the upper abdomen being due to irritation in the course of the 9th and 10th intercostal nerves, and when present in the lower abdomen to irritation of the 11th and 12th intercostals or due to a more or less general congestion of the intestines. Less frequently there is a collection of serosanguinous fluid in the abdomen; in these cases the condition of the patient is not benefited by operation, but rather harmed. This fluid will be absorbed in time if the patient survives. Occasionally there is a purulent local or general peritonitis, most often present in the upper abdomen, which is generally a terminal picture of a general pyemia, or the extension through the diaphragm of an empyema. One must always bear in mind the frequency of a hemorrhage or abscess within the rectus muscle, which has often been mistaken for a ruptured appendix. In these latter cases simple evacuation under local anesthesia is sufficient to affect a rapid cure.

One should be especially cautious in making a diagnosis of acute appendicitis or gallbladder disease during or immediately following influenza. During the course of an epidemic, it should always be borne in mind that there is a possibility of the abdominal symptoms being the first to appear. If the patient has other symptoms of, or is convalescing from influenza or influenzal pneumonia, one should be extremely conservative in recommending an operation for appendicitis or gallbladder disease. It is certain that a large number of unnecessary operations were performed during the recent epidemic.

The following points should be remembered in making a diagnosis of appendicitis in these cases:

In uncomplicated influenza, there is almost always a leucopenia. In surgical appendicitis complicating influenza there is usually a considerable leucocytosis. A leucocytosis of over 20,000 in the first eight hours or so of an appendicitis is rare, and would be strongly suggestive of pneumonia. It is possible to have an appendicitis without any increase in the leucocytes.

In chest conditions, the pain is most often referred to the upper abdomen, and in most cases is rather more diffuse than in appendicitis or cholecystitis. In chest conditions, also, the facial expression does not indicate that the patient is suffering as acutely as would be the case if a real surgical condition were present in the abdomen, but is resigned or lethargic. The rigidity of the recti is more likely to be equal, where the condition is due to a chest lesion, and light, superficial palpation is apt to cause the patient almost as much pain as deep palpation, which is not usually true where a real surgical condition is present within the abdomen.

A movement of the alæ nasæ with respiration is very suggestive of a chest lesion, usually being absent in surgical lesions of the abdomen, unless extremely advanced. Cyanosis and rapid breathing are suggestive of a chest lesion. Jaundice and vomiting occur so frequently in influenzal conditions that their presence should not be construed as indicating a surgical lesion.

In concluding, I want to emphasize the following points:

1. Influenza is a protean disease.
2. Abdominal symptoms which would ordinarily indicate the need of an urgent surgical operation are commonly present during influenza, and their frequency is not sufficiently brought out in the text-books.
3. Conditions requiring an abdominal operation during influenza or its convalescence are exceedingly rare.
4. While in some cases, a differential diagnosis is extremely difficult, the safest procedure in doubtful cases is to adopt an expectant treatment.
5. In case an exploratory operation is decided upon, a local anesthetic is advisable.
6. A surgical abdominal lesion and influenza may occasionally coexist.
7. Many unnecessary and harmful operations have been performed during the course of influenza, due to the lack of appreciation of the frequency with which abdominal symptoms occur in influenza.
8. The great majority of cases showing abdominal symptoms have no surgical basis, but are either reflex, or due to some condition which would not be benefited, but rather harmed by a laparotomy.
9. The chest should always be carefully examined before operating for a supposed acute surgical lesion of the abdomen.

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57 TRUMBALL STREET.

THE TREATMENT OF DRUG ADDICTION.

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Drug addicts may be divided into two general classes. The first class is composed of people who have become addicted to the use of drugs through illness, associated probably with an underlying neurotic temperament. The second class, which is overwhelmingly in the majority, is at the present time giving municipal authorities the greatest concern. These people are largely from the underworld or channels leading directly to it. They have become addicted to the use of narcotic drugs largely through association with habitués and they find in the drug a panacea for the physical and mental ills that are the result of the lives they are leading. Late hours,

dance halls, and unwholesome cabarets do much to bring about this condition of body and mind and in a great many cases these people are found far below the standard mentally.

On August 25th last a hospital for the treatment of drug addiction was opened at Riverside Hospital on North Brother Island. While a few isolated cases had been treated there previously, up to that time it was found practically impossible to give cases withdrawal treatment in large numbers. Beginning September 1st an organization was established whereby we were enabled to treat successfully one hundred cases a week when required.

When a drug addict reached the hospital his pedigree was taken and he was admitted to the receiving ward, where all his clothing and belongings were checked up and an entire new outfit given him, including hospital shoes. From this building he was taken to what we term the preparatory ward, where after a period of six days he was brought down to the lowest amount of narcotic that would hold him without the usual signs of drug deprivation. Our experience has taught us the absolute uselessness of ascertaining the amount of daily consumption before treatment. For the majority of cases the amount is very much increased for fear of a too sudden reduction.

We have been taught that in the vast majority of cases they are using much larger amounts than is necessary for their bodily comfort, in other words, most of our patients have come to the hospital not only feeling comfortable but actually intoxicated from excessive doses of the drug. We have been taught that after two or three days in the hospital the oldest offender can be made reasonably comfortable on from two to three grains in twenty-four hours, notwithstanding the fact that most of them have told us that they were consuming from twenty to sixty grains of morphine or heroine in twenty-four hours. Four fifths of the 2,300 patients treated at Riverside Hospital were addicted to heroine while about one-fifth were addicted to morphine, opium pipe smoking, laudanum, or paregoric. About twelve and one-half per cent. of the heroine addicts were continual users of cocaine while five per cent. would be termed occasional indulgers. The fact of the addiction being complicated by the use of cocaine made little or no difference with us during the period of preparation, they just simply did not get it and did without it. The use of cocaine itself gives none of the symptoms of deprivation as do the products of opium. During this period of six days reduction we gave them a full amount of catharsis but there was no drastic purgation. We employed a system of gastrointestinal elimination on the fourth day by giving capsules of calomel, ipecac, rhubarb, atropine and strychnine, supplemented by a series of colonic saline irrigations. The free catharsis that this treatment caused was usually quite effectual and on the fifth day elimination by this method was discontinued, to be resumed again on the sixth day.

At six o'clock on the morning of the seventh day the patients are given a large dose of castor oil followed shortly afterwards by a small dose of morphine, the last they receive in the institution

unless otherwise indicated. About four hours later the first signs of drug deprivation are usually experienced. This is a signal to start using a therapeutic anesthetic. At Riverside Hospital we use the hyoscine hydrobromate. I may say here that we use hyoscine internally practically with the same object in view that the general anesthetist employs ether, in other words, as these various symptoms reappear, small but adequate doses of hyoscine are given at irregular intervals, depending upon the physiological action in the particular case. Personally I find hyoscine, when used with reasonable care and in small doses, and particularly after thorough and satisfactory elimination, a perfectly safe therapeutic agent, wonderfully adapted to this stage of the treatment. During this period, which we have termed the period of therapeutic anesthesia, we are combating all the phenomena attending narcotic deprivation, such as vomiting, general restlessness, intestinal colic, cramps in the legs, and a rapid, feeble pulse. These characteristic symptoms are held in check by the frequent administration of small doses of hyoscine, usually hypodermically. At the end of thirty-six hours, under favorable conditions the hyoscine is discontinued and we arrive at the period of convalescence. Before considering this period it might be well to mention some of the difficulties encountered in connection with the hyoscine period. During the period of hyoscine administration no food whatever is given but plenty of alkaline waters.

In the first place, no two cases ever present the same symptoms at the same time, consequently every case presents an individual problem. In one case it may require only nine or ten doses of 1/300 of a grain to keep the patient comfortable, while in another case thirteen or fourteen doses of 1/250 of a grain may be required to combat the symptoms of deprivation. Again, the patient may have been a habitual cocaine user and we find this type gives considerable trouble during the withdrawal treatment; they very frequently after eighteen to twenty-four hours of hyoscine anesthesia become maniacal and often go into convulsions. We have found that a single dose of morphine at this stage will counteract these symptoms and in no way interfere with the hyoscine treatment, which is resumed two or three hours later. At this stage of the treatment we produce what might be properly termed a modified twilight sleep. After thirty-six to forty-eight hours of withdrawal treatment the patients are found to be moderately intoxicated by the accumulative action of hyoscine; even after a period of twelve hours they experience all the customary signs of their intoxication and we describe this period as the posthyoscine hysteria. This is followed in twelve hours by a general feeling of depression and weakness which lasts from two to seven days, depending upon the recuperative powers of the individual and the duration of the addiction. During this early convalescent period they are given hot baths and mild hypnotics, if indicated, and a restricted diet.

Forty-eight hours after the last dose of hyoscine is given the majority of patients are ready to be transferred to a building which we term the first convalescent ward. When patients are not quite

ready to be sent to the ward, they are transferred to a building known as the infirmary, for the reception of patients whom we term laggards. These laggards comprise patients who through long years of addiction and numerous treatments have become de-vitalized and their convalescence is usually prolonged and tedious. After a week or ten days in the first convalescent ward the patients are transferred to the final convalescent ward, where their physical reconstruction begins. They are given light exercise in the gymnasium and they are taught the useful lessons of clean living. After a week of walking around and indulging in light exercise they are assigned to some work which we have included in our program under the name of occupational therapy. The application of this treatment is, I might say, the most trying in the entire course, for the average drug addict of this type is lazy, to say the least, but we have been able at Riverside Hospital to prove to them the necessity for their physical upbuilding, if they are to abstain from drug addiction. For after all we can bring them to a state of physical balance where the future use of the narcotic drug is unnecessary to their physical needs; we can keep them long enough to show them the folly of their addiction, we can impress upon them the fact that they do not need the temporary mental exhilaration that goes with its use, but as yet we have found nothing that will remove the psychic trauma that its prolonged use has inflicted.

The prognosis in drug addiction, to my mind, is one of the most difficult in the entire field of medicine, and in venturing upon one we must take into consideration the etiological factors that led to the addiction, the type of the individual, the environment to which the patient will return, and the encouragement that society in general will mete out to this unfortunate sufferer upon his discharge from our institution.

A NEW METHOD FOR DETECTING DRUG HABITUÉS.

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The finger of a suspected opiophagic patient is stabbed with an automatic lance. The blood is drawn into a Gowers's blood pipet holding two cm. This is expelled into a small test tube five by five-eighths cm., containing one c.c. of normal saline solution. This is repeated for five more saline tubes. The tubes are numbered 1-2-3-4-5-6. Shake each tube gently immediately after the blood is introduced. Prepare two more saline tubes and number them 7 and 8. If any shreds or clots of blood should be present, remove them with a sterile platinum wire. As a rule they will not be present.

Tubes 1 and 2 are controls, containing only saline solution and blood. To tubes 3 and 4 add .2 c.c. of a 1-100 solution of morphine sulphate in distilled water. The solution should be neutral, it must not be either acid or alkaline therefore it should be tested with red and blue litmus paper and with phenolphthalein and methyl orange indicators. To tubes 5 and 6 add .2 c.c. of a 1-200 solution of morphine sul-

phate made with a good grade of the drug in distilled water. Tubes 7 and 8 contain the blood of normal individuals.

RESULT OF TEST.

After standing at room temperature out of the light for from twelve to twenty-four hours or even less, tubes 1 and 2 (controls) show complete inhibition of hemolysis with a clear supernatant fluid. Tubes 3 and 4 show almost complete inhibition of hemolysis with a very cloudy supernatant fluid. This flocculent flaky appearance is the positive test for a drug habitué. Tubes 5 and 6 show a modified flocculent appearance of supernatant fluid. Tubes 7 and 8 (true controls of normal blood) show a clear supernatant fluid with complete inhibition of hemolysis. I would like to caution the investigator that upon agitation of the tubes, the flocculent deposits settle to the bottom of the tubes. The tubes should be placed against a black background in order to accurately interpret the results, as a clear bright light obscures the readings.

It is also possible that the reaction takes place with any of the narcotic drugs such as heroine, codeine, and others. The blood of a drug user has amboceptor with at least one narcophore binding cell which has an affinity for the drug the patient is taking. This is a rapid method of testing the blood of a drug addict as the blood does not have to be passed through the lower animals to secure antiserum. All the glassware should be sterile, the technic is simple and anyone can do the test. The test may also be done with rabbit serum which has been sensitized with the blood serum of a drug habitué. I do not state that this test is perfect but in the course of time it should be made an aid to diagnosis.

A BACTERIOLOGICAL STUDY OF RIPE OLIVES.

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This study of ripe olives was made under the auspices of the Dairy and Food Commission of the State of Pennsylvania following several epidemics of botulism (attributed to ripe olives) with fatal results in different parts of the United States. In all, there were more than two hundred and fifty samples examined, including loose olives, canned varieties, and a large number in bottles. Combinations of ripe olives with pimento (sandwichola) were also included.

All specimens of olives examined were in perfect condition regarding canning, that is, there were no swelled cans, none buckled or leaky, and those in jars and bottles presented no leaks whatsoever. Some of the cans, however, were dirty and shopworn. There were never any offensive odors of putrefaction or decomposition, and in the majority of samples, the flavor was good, though in a few an insipid taste was noted. The consistency of the fruit was extremely variable, as was the color, which varied from yellowish green to dark green and to a reddish purple, and a number of cans contained olives of variegated colors.

When placed in a mortar and crushed with a pestle, some were so ripe or intensively treated chemically that the pulp was immediately reduced to a paste, the pit being expressed at once. In others a great deal of pressure was needed even to crush the pulp and the pit was never cleanly removed. Taking the olive between the fingers and thumb, pressing in the longitudinal axis and exerting but gentle pressure, was all that was necessary to make the pit fly out in some specimens and crush the pulp. In twenty-two specimens this pasty condition was noted. In other lots of fruit no amount of pressure between the fingers and thumb could crush the olive or expel the pit.

Thus it can be seen that even in the same cans, olives exhibiting several degrees of ripeness or various stages of chemical treatment were present, especially in the small variety. In three instances an actual blemish was seen upon the fruit; in these specimens almost every olive in the can was marked with small white specks, about the size of a pin head, resembling an insect bite. Removing several of these small spots, there were observed, upon microscopical examination, numerous bacteria, resembling in morphology and staining characteristics *Bacillus proteus*. When these olives were squeezed a jet of fluid squirted from the little specks.

In two specimens, Grecian ripe olives, the fruit was of a reddish purple color, showed longitudinal fissures (cuts), and while the pulp was extremely soft, the pit was adherent. The olives that were collected in bulk, when allowed to stand in the bottles for a day or two after examination, soon became covered with mold fungi. When first received they were moist, showing that they had been covered with liquor when offered for sale. One or two samples presented fruit with part of the skin peeling off, and these were distinctly sour to the taste. The technic employed in the bacteriological examination of these olives was as follows:

After numbering the specimens, the top of the can or jar was cleaned with a rag, and then exposed to the flame of a bunsen burner, or placed in boiling water, to remove any bacteria from the surface of the receptacle. The can or jar was next opened with a can opener, which was always kept in a bath of boiling water. Upon opening the can, the first several layers were removed with a sterile forceps, and from the depths of the can at least four large or six small olives were placed in a sterile mortar and then cut with a sterile scissors or crushed with a sterile pestle. After crushing the pulp, about thirty c. c. of sterile salt solution was added, and the pulp thoroughly ground in this solution. Then with a long sterile needle (made expressly for anaerobic cultures) at least one to two c. c. of suspension were drawn into a sterile ten c. c. syringe and injected into deep tubes of culture media, the surface of the medium covered with sterile oil and the tubes kept at ordinary room temperature. The culture media used were alkaline litmus glucose agar, alkaline gelatin and a medium made with pumpkin as a basis, solidified with agar. These inoculations were kept under observation for at least two or three weeks. No evidence of growth

or liquefaction occurred up to this time. Sterile bouillon was also inoculated, using ten c. c. of the liquor from the cans or jars. In almost every instance, at body temperature (37° C.) in an aerobic atmosphere, a firm pellicle developed within twenty-four to thirty-six hours. These inoculations were made into bouillon to determine if the liquor contained living aerobic organisms.

Regarding the investigation of the toxicity of the olives, the salt solution suspension made of the pulp was injected intraperitoneally into guineapigs and white mice. One c. c. was injected into the white mice and two c. c. into the guineapigs. (In the white mice the dose injected was about one twentieth of the body weight of the animal.) It is asserted by Von Ermengem and others that .0005 c. c. of toxin is fatal to guineapigs and mice, so these animals surely would have received an amount sufficient for poisoning, if present in samples. These animals were kept under observation for a number of days.

In another set of animals, feeding experiments were conducted upon white mice. The salt suspensions of the olives were placed upon bread and this was all the animals were given for twenty-four hours. It is said that the most pronounced symptom of botulism in the lower animals is paralysis of the posterior extremities. No animal under observation presented these symptoms.

Three mice (3883, 3865, 1263) died of traumatic peritonitis following inoculation (six hours, twelve hours, twenty-four hours); one mouse (6675) was killed as a result of a fight; two others died (3865, 1264) from inoculation, but no lesions were observed at autopsy, and the heart blood was free from bacteria. One mouse died within twenty-four hours after being fed on soaked bread. No lesions were demonstrable at autopsy, and its blood was sterile. One guineapig (3862) died after four days, but autopsy showed few adhesions in peritoneal cavity and the blood was sterile.

As none of the animals died of botulism it was thought that by allowing the suspension to stand for a day or two in the ice box more toxin (if present) would be brought into solution. But even after standing this length of time, and inoculating and feeding mice and guineapigs, no ill results were noticed. In examining the sediment of the salt suspension, organisms of some sort were observed in all specimens. A number contained hyphæ and spores of mold fungi; quite a number contained yeasts and molds, while the greatest number showed gram negative bacilli. A few others showed gram positive bacilli. Some contained gram positive micrococci, arranged in short chains, and in a few the chains of micrococci were gram negative. In two specimens a bacillus was encountered which possessed the characteristics of the *Bacillus tetani*, i. e., about the same size and with a terminal round spore. It was generally gram negative, however. Long filaments resembling leptothrices, and bacilli corresponding in morphology to lactic acid bacilli were also encountered. In some specimens, even though the consistency of the fruit was pasty, very few organisms were found, and in others, every field of the slide was well filled with microorganisms.

If the ripe olives would cause botulism, there was abundant opportunity for the production of the disease, as there were three of us working upon the specimens, each eating at least twelve to twenty olives a morning, during examinations lasting several weeks. On one occasion, several people ate at least one quart of the olives in the course of two hours and no untoward symptoms resulted.

To determine whether the fruit would undergo any putrefactive changes after being kept for a certain time, a number of olives were placed in sterile bottles and placed in various parts of the laboratory. Some had a small quantity of the original liquor upon them while others were kept without liquor. Some were kept at ordinary room temperature upon the window sill of the laboratory, some in a dark closet, while others were kept in the refrigerator. One can was kept half full of olives with some of the original liquor upon them. (The ordinary room temperature during these observations varied from 18° to 21° C.). At the end of four months no disagreeable odor was noticeable and except in those where no liquor was left on specimens, slight shrinkage of the fruit was observed, otherwise there was no change in the appearance or consistency. In all specimens, however, a mold fungus developed.

In one bottle, holding 500 c. c., olives of various brands were placed with liquor completely covering the fruit, and on the surface of the liquor a pellicle of mold fungus developed and one or two olives on the surface were found quite soft and mushy, but the majority of the fruit was as good as when placed in the jar. In all specimens where the mold odor was not predominant, the agreeable aromatic odor of the ripe fruit was noticeable. In the can which was kept unsealed on the window sill for four months a rather tough mold pellicle developed but the fruit for the most part was intact and absolutely odorless. In a sterile flask holding the liquor of several containers which stood around the laboratory for over three months, complete evaporation of the liquor occurred and the residue gave off an oily odor but lacked anything of a disagreeable nature.

Four months after date of preliminary examinations, specimens that were kept upon the window sill and working table, exposed to daylight, and those from inside a dark closet, were ground up in a sterile mortar and sterile salt solution added. This salt suspension was inoculated into guineapigs in amounts of 0.5 c.c. subcutaneously. None of the animals exhibited the slightest ill effects, showing an entire absence of the development of any poisonous substances in olives that were originally sound and which had been left standing at ordinary room temperature for a period of several months (under various conditions of sunlight). All the olives examined, as stated before, gave off a pleasant, aromatic odor, and even when kept for a long period of time (four months) with and without the preserving liquor, the same aroma was noticeable and in some an oily odor was observed.

Tubes containing sterilized macerated ripe olives were inoculated with a strain of *Bacillus botulinus*

obtained from the Department of Agriculture in Washington, and though no difference in the consistency of the olives was noted, yet a disagreeable, rancid, heavy penetrating odor developed anaerobically which persisted for a number of days following the removal of the oil making the anaerobic seal. Regarding the strength of the liquor upon these olives as originally prepared, it was found by LaWall that "the density of the brine of the moist packed olives was investigated and found to vary greatly. The lowest figure was 1.75 per cent. of salt present and the highest was 9.3 per cent., the average being slightly less than four per cent." In the unripe olive the salt content of the liquor is usually about six to seven per cent. With reference to the preparation of the olives in glass, it has been found that the temperature to which these packages are exposed in preparation was far lower than that where the olives were packed in cans. In those instances where deaths occurred from botulism it was stated that the fruit gave off an offensive, putrid odor.

In my opinion ripe olives when packed should be sound and placed in a six or seven per cent. solution of salt and sterilized as thoroughly as any other canned fruit or vegetable. Where glass packages are used, naturally the glass must be of a suitably tempered nature to withstand heating to a high degree; the commercial glass used will not stand this high temperature without cracking.

It is probable that the olives which caused the death of individuals partaking thereof were unclean, putrid or decomposing when packed, and the heat to which they were exposed was not high enough nor prolonged sufficiently to destroy the toxins or spores already developed. Dickinson (1) and his coworkers proved that the spores of the *Bacillus botulinus* resist the temperature of boiling water for two hours, and a temperature of 95°C. for more than three hours. According to earlier observers, especially Von Ermengem, a temperature of 80°C. for one hour effectively destroyed the spores of the organism. The work of Burke (2) demonstrates the ubiquity of the *Bacillus botulinus*. She found in five localities in Central California fifty or more miles distant from each other, *Bacillus botulinus* in bruised and bird pecked cherries, crop, gizzard, and intestinal contents of birds, hay, leaves, insects, spiders, bush beans, etc. She concludes that the *Bacillus botulinus* is widely distributed in nature, and that it is present in the garden and on fruit and vegetables when they are picked and not necessarily associated with active decay. The observations of Cheyney (3) proved that an average of eight per cent. of canned foods examined contained living organisms, and that the usual methods of processing are inefficient in that they do not result in a complete sterilization.

What is desirable is a sterile product, whether this product be meat, olives, or vegetables of any kind, and until this end is attained, there will occur outbreaks of food poisoning of one type or another with perhaps some fatal results. The work of Weinzirl (4) upon canned foods is also instructive in demonstrating the care exercised by commercial

industries in the canning of many foodstuffs.

From the examinations made of various brands and varieties of ripe olives, no evidence of *Bacillus botulinus* or its toxin was found. Bacteria were present in all preparations but no anaerobic organisms developed in the gelatin or litmus lactose agar or pumpkin agar (which were made alkaline in reaction).

From the rancid, offensive odor developed in the macerated olives by the growth of *Bacillus botulinus* intentionally added, it would appear that where any canned foodstuff gave off this odor it should immediately be rejected. The number and variety of organisms found in spreads demonstrate that gross carelessness was exercised in a sanitary sense in preparation of the fruit, or that these bacteria probably represent the organisms found in overripe or decaying fruit.

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LONDON LETTER.

Smoke Evils in London.—Disabled Ex-Service Men.
(From our own correspondent)

LONDON, June 23, 1920.

On June 18th the Ministry of Health issued an interim report of the Department Committee of Smoke and Noxious Vapors Abatement, in which it is stated that means which produce little or no smoke are available and practicable for cooking, heating water, and warming rooms, and among reasons for issuing an interim report is that the great housing schemes now being undertaken with the aid of the Government subsidy afford a unique opportunity for securing these means in the new houses. The committee profess themselves as satisfied that domestic smoke from the burning of raw soft coal is not only a serious menace to health and a damage to property, but also wasteful, as all the valuable byproducts are lost. Central hot water installation is strongly advocated, from the standpoint of health, comfort, and economy. Among the conclusions and recommendations made by the committee are the following: Whenever a supply of gas is available a gas stove shall be installed instead of a coal range.

The cheapest and most efficient way of providing hot water, where a central supply is not practicable, is by a coke-fired boiler. As far as practicable gas fires, hot water radiators, or electric radiators should entirely supersede the old fashioned open coal fire, adequate means for ventilation being provided. In none of the houses built with the assistance of the Government subsidy should more than one or, in exceptional circumstances, two coal grates be installed. Whenever coal ranges and coal grates are installed they should be of a type adapted to the use of coke as well as of coal.

Adequate means for regulating the draught should in all cases be provided. The central housing authority should decline to sanction any housing scheme submitted by a local authority or public utility society unless special provision is made in the plans for the adoption of smokeless methods for supplying the required heat. The only exception to this should be when the central authority is fully satisfied that the adoption of such methods is impracticable. The Government should encourage the coordination and extension of research into domestic heating generally.

* * *

On June 16th evidence was given before the House of Commons Select Committee on Pensions with regard to the employment of exservice men, and particularly disabled men. Mr. T. W. Phillips, principal assistant secretary to the Ministry of Labor, who has charge of the employment department, stated that there were 420 employment exchanges and 1,196 branch employment offices in the United Kingdom. In the period since the armistice to May last the exchanges had found employment for 1,612,000 individuals, 824,000 men and 490,000 women, of whom about 403,000 were exservice men who were placed in employment for the first time since leaving the forces. In addition, there were large numbers of exservice men whose return to preservice employment was arranged by the exchange under the demobilization scheme period. During the same period about £988,200 was paid out in unemployment benefit under the national insurance acts, and about £52,534,000 in out of work donations.

In August, 1918, there was established at Catherine Street, Aldwych, a special exchange to deal with disabled men only, the staff itself consisting almost entirely of disabled men. A member of the exchange staff attended the office of the Neurological Board at Lancaster Gate and took particulars of the neurasthenic men. About 1,700 cases had been registered and thirty-three placed monthly, while 337 had been submitted for training. These cases presented exceptional difficulty, as most employers declined to take neurasthenic men. The manager was submitting a scheme for coordinating curative treatment and placing. On June 4th last, the number of firms on the national roll was 16,989, employing an aggregate of 2,496,677 work people, of whom 140,759 were disabled. The total number of disabled men placed in employment through the exchanges since the armistice up to May 28, 1919, was 71,983.

An analysis which was compiled of the types of disability of the disabled men who had applied to the exchanges for assistance in obtaining employment from June 17, 1918, to the end of May, 1920, showed: Injuries to arms, 40,569 men; injuries to legs, 42,610 men; lung affections, 16,967; heart affections, 16,581; neurasthenia, 12,406; internal injuries, 14,090; rheumatism, 10,009; debility and weakness, 8,040; injuries to head, 7,801; injuries to eyes, 6,811; muscular ailments, 4,407; epilepsy, 2,099; mental derangements, 1,425; deafness, 3,127; various minor ailments, 25,881.

Editorial Notes and Comments

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NEW YORK, SATURDAY, AUGUST 14, 1920.

AUTHOR PHYSICIANS—DR. CONAN DOYLE.

Although Sir Arthur Conan Doyle, the creator of Sherlock Holmes, was for several years a practicing physician, it was foreordained from the very beginning of his career that literature rather than medicine should be his life work. He began writing stories of adventure, his biographers tell us, at the feeble old age of six. Against such precocity what chance was there for mere medicine? Altogether Dr. Doyle's medical activities covered a period of about ten years, not counting the time he spent in South Africa during the Boer War, when he was honorary senior physician and registrar in the Langman Field Hospital.

Dr. Doyle was born in Edinburgh on May 22, 1859, and was graduated from Edinburgh University in 1881 as an M. D. A year later, after a voyage to South Africa, he began practicing in Southsea, but the practice of medicine to him was more of a makeshift than anything else, despite the elaborate preparation he had made for it at Edinburgh and in Germany. All through his student days he devoted his leisure hours to writing, and in one of the professors at Edinburgh, Dr. Joseph Bell, a man of astonishing analytical and deductive powers, he found the original from whom Sherlock Holmes was subsequently drawn.

It was in 1878 that his first story was published in *Chambers' Journal*—a romance based on an old Kaffir superstition, but it was not until nine years

later, when he was attending patients in Southsea, that his *Study in Scarlet* came out. It was in this volume that Sherlock Holmes and Dr. Watson made their first appearance, but the popularity of the book was not astonishingly great nor the royalties from it large. Dr. Doyle continued the practice of medicine. In 1890 his *The White Company* and *The Firm of Girdlestone* were published, and he left Southsea and went to London as an eye specialist. Soon thereafter the royalties from his books and the checks for his serials and short stories began to pour in, and he forsook the medical profession forever.

What the loss to the medical profession may have been is uncertain, but there is no doubt that the gain to literature was considerable. As a writer Dr. Doyle has firmly established himself in English literature. Few writers have been more versatile than he. We think of him mainly in connection with the Sherlock Holmes stories. Probably on these his greatest fame will rest, though critics contend that from a literary standpoint his best work was done in the field of the historical novel—*The White Company*, *Micah Clark*, *The Refugees* and others, tales of olden times full of action and hairbreath escapes, good description, convincing atmosphere, and painstaking fidelity to detail.

Dr. Doyle is also a poet and historian. Two volumes of poems—*Songs of Action* and *Songs of the Road*—stand to his credit, and in the field of history he gave us two volumes on the Boer War and was Britain's official historian of the British campaigns in France and Flanders during the world war. The British Government gave him sole access to official records and other sources, from which he compiled the six volumes which tell of the British army's part in the struggle against Germany.

As if this were not versatility enough, Dr. Doyle also has won laurels in the playwriting field. Perhaps the best known of his work in this line is *Waterloo*, a one act play written in 1894, in which Sir Henry Irving played the leading part, both in this country and in London.

However, it was Sherlock Holmes who gave Dr. Doyle his tremendous popularity, a popularity that has had few parallels in literature. With these stories of crime detecting he set a vogue which brought out a host of imitators. As for detective stories today on the Holmes model, their name is legion. This is not to say that Dr. Doyle was the

first to write a detective story. The controversy over whether he or Edgar Allan Poe created the detective story is a literary *cause celebre* which has raged for many years. Certainly Poe wrote the first detective stories, but just as certainly Dr. Doyle created the modern detective as he exists in the literature of our time.

In all Dr. Doyle's stories there is a masculine, healthful and courageous spirit. His pages are stimulating from first to last. He sees life as a whole, and his outlook is broad and genial. His is a sane philosophy of life, and one does not have to be a good guesser to size him up for a man of action, an outdoor man, a devotee of all outdoor sports, who has been whaling in the Arctic seas, has made balloon and airplane flights, has been skiing in the Swiss Alps, and is a crack rifle shot and an inveterate golfer. Time was when he was a formidable foe at football and cricket, but advancing years have crowded those activities into the background.

In recent years Dr. Doyle has become greatly interested in the occult science, and is one of the staunchest upholders of the theory of spiritism. In all Dr. Doyle's writings only one volume is of a medical nature and that in no wise technical—*Round the Red Lamp, Being Facts and Fancies of Medical Life*, published in 1895. Dr. Doyle was knighted in 1902.

EARLY SYMPTOMS OF NERVOUS DISEASE.

The trend of medicine seems to be in the direction of preventive treatment. Sir James Mackenzie, the great specialist, has retired while at the height of his fame to the small city of St. Andrews in Scotland to endeavor to carry out his views with regard to the early symptoms of disease. His idea is to teach the general practitioner how to recognize and treat the early symptoms of disease, for the general practitioner is the only man who is likely to have the opportunity of observing early symptoms. This is the essence of preventive medicine. This seemingly most rational conception of the practice of medicine has caught the imagination of the British medical profession; at the meeting of the British Medical Association the subject was referred to at every turn, and in the papers read the necessity for early diagnosis was dwelt upon. If a disease can be diagnosed before it has gained a foothold, proper treatment, though not necessarily always therapeutic, will generally prevent it from progressing. Perhaps cancer is the most selfevident example of this truth. If cancer can be diagnosed at an early

stage, treatment can be applied which promises most satisfactory results. As with cancer so with most other diseases early diagnosis ensures successful treatment.

Dr. Henry Head at the recent meeting of the British Medical Association opened a discussion in the section of neurology and psychiatry by reading a paper dealing with the early signs and symptoms of nervous disease and their interpretation. He pointed out that the experience and outlook of the family physician leads him of necessity to a different attitude toward early signs and symptoms than that of the specialist. The former sees so many apparently serious conditions pass away that he tends to become sceptical with regard to the minor manifestations which often lead to permanent disability. On the other hand, the knowledge of the consultant leads him confidently to anticipate the worst. Moreover, early symptoms frequently produce so little discomfort that a medical man is not consulted. Nearly all histories of illness taken from the laboring population start from the moment when the patient was forced to leave his work. Among the well to do, the story usually begins with the first visit of the doctor. Such symptoms as precipitate inactivation or slight changes in articulation, though trivial manifestations, may be of profound diagnostic importance. Again, early signs are not only neglected because they seem trivial, but the physician frequently omits to establish their true nature during the short period of their existence. Frequently the significance of some symptom or sign is not appreciated owing to the adoption of a misleading general diagnosis. The early pains of spinal syphilis are thought to be due to fibrositis. Disseminated sclerosis frequently begins with short attacks of what is called influenza, the temperature is raised little if any, but the patient feels ill, with a general sense of powerlessness. This may be accompanied by transitory loss of vision, diplopia, or incontinence of urine. But the diagnosis of influenza has blinded the physician to the condition with which he has to deal. Sometimes the history though accurate in every particular may be almost perversely misleading. A cervical rib is a congenital abnormality and yet the symptoms and signs it produces may become manifest for the first time at almost any age.

The war has taught us much concerning both functional and organic nervous disease and perhaps especially concerning the different varieties of headache. The question of headache alone provides a difficult diagnostic problem to the medical man, and while the specialists in nervous diseases are far from comprehending the significance of the

various forms of headache, they can be classed roughly according to certain broad rules. Dr. Head does this in the paper referred to. Many medical practitioners do not differentiate between the different kinds of headache, or at least do not apply to them their diagnostic significance. Some even treat a headache as if all pains in the head were of similar diagnostic import. It goes without saying that early diagnosis, diagnosis early enough to prevent the affection from going farther, is very difficult, frequently impossible even when the general practitioner is sufficiently well trained in early symptoms and signs and their significance. But it seems that a good deal can be done in that direction. Early diagnosis and proper treatment is the really scientific preventive medicine, which is said to be the medicine of the future.

INGUINAL EPIDERMOPHYTIA.

Since the war a dermatosis has become singularly frequent, namely, the mycosis first described by Hebra under the name of *eczema marginatum*, or *tinea cruris*, whose causal agent is the epidermophyton discovered by Sabouraud. The affection has a predilection for the inguinal region, but is not confined to it, because it is also frequently found in the folds of the axilla. The process may also develop around the umbilicus and even in various degrees on the trunk and limbs, principally the lower limbs.

When it occurs in the inguinal folds, it begins on the thigh, in the immediate neighborhood of the fold, in the form of a red, dry, irregularly rounded spot, extending over the thigh and the genitalia and presenting a variable aspect after fifteen or twenty days. At times it is of an intense red color, dry, smooth, and glistening, slightly desquamated at the centre and marked off by a slightly raised border, and presents a thin white squamous area about two millimetres within the border concentric to it. At other times the color of the central portion, much less marked, is slightly fawn yellow, the borders rose colored and less projecting, and immediately within the borders a continuous zone two to three millimetres broad is seen, made up of fine, thin, white scales that are more or less detached. Sometimes instead of one squamous border there are two concentric ones about two millimetres apart, thus forming a cockade.

Usually round, the patch may be bilobate or trilobate, and sometimes at a short distance from it will be found clustered together regularly shaped circles having the same appearance and varying in size from a pea to a ten cent silver piece. On the scrotum and labia majora the lesion assumes a dif-

ferent aspect. On account of its pale rose color it is hardly noticeable, but it manifests itself by a thin, fine grayish white desquamation, forming a rounded sinuous outline, recalling the gray tint which characterizes cutaneous lesions in the negro.

The plaques extend to the suprapubic region only exceptionally and join together on the median line. Less infrequently they extend to the posterior aspect of the scrotum, over the perineum and around the anus, and cease at the upper portion of the intergluteal fold. In all these regions the lesions are superficial, pale red in color, and their limit usually marked by a border of desquamation. They are invariably dry.

The second site of election for epidermophytia is the axillary region, where the spots, rather bright red in color, rounded, distinctly limited, with a marked desquamative aspect, are frequently multiple and, by their cohesion, form plaques having a polycyclical contour. They occupy the axillary hollow. Localization around the umbilicus is much less common. It manifests itself by a rounded patch, with a distinctly limited border, with or without fine desquamation, often measuring as much as twenty or more centimetres in diameter, sometimes concentric to the umbilicus, at other times more or less eccentric to it. The plaques developing on the trunk and segments of the limbs are also rounded in outline, with a bright red surface, and slightly raised distinctly marked edges closely surrounded by a more or less marked collar of desquamation. Epidermophytia is always accompanied by pruritus, especially nocturnal, which occurs at the onset of the lesion and persists while recovery is taking place. The process may last a year if not treated with regularity, but after a certain time it ceases to spread. Appropriate treatment results in a rapid recovery.

The diagnosis is usually easy, but in doubtful cases recourse should be had to the microscope. The intertrigo set up by perspiration occupies the inguinal folds, but the lesion has a less regular configuration, undergoes evolution quickly, and is accompanied by a manifest oozing. The same may be said of eczema of the region. Psoriasis, when it develops in the inguinal area, is covered by desquamation which is made more distinct by scratching, and if this is continued characteristic minute droplets of blood will be seen to appear. In circumscribed lichen the color is paler, the surface of the lesion is more brilliant and typically plaided. In erythrasma, the long duration of the affection, the yellow color of the plaques, their irregular configuration with finely insular borders, and the absence of any raised surface make the diagnosis easy.

In doubtful cases the epidermis should be superficially scraped at the border of the lesion, the product placed on a slide and a few drops of a forty per cent. potash solution added. Cover with a slide, beat slightly and the mycelian filaments can be seen composed of quadrangular cells having a double contour. These elements are seen in the midst of the epidermic cells and, contrary to trichophytosis, they are invariably absent on the hairs.

Epidermophytia is rare in ordinary times but during the war it was frequent. It was often transmitted by direct contagion, sometimes during coitus. Lack of bodily cleanliness is also a factor in its production, and it would seem that the disease can be transmitted by the underclothing when not properly dried. Treatment consists of repeated applications of tincture of iodine diluted to one-third strength with friction over the surface of the plaques. It should be repeated every second day for ten to twelve days. As to the pruritus, it can be relieved by a lotion of menthol in alcohol diluted with a one per cent. watery solution of carbolic acid.

News Items.

Dr. Robinson and Dr. Turner Elected.—Dr. G. Ernest Robinson and Dr. John P. Turner were elected associate chief surgeons of the Frederick Douglass Hospital, Philadelphia, at a staff meeting on July 30th.

Award of Riberi Prize.—The Riberi prize of the Royal Medical Academy of Turin has been awarded to Dr. Giuliano Vanghetti for his work in connection with the utilization of the muscle of a stump to actuate an artificial limb (cineplastic operation).

Austrian Children in Desperate Condition.—Austria has asked Switzerland to feed 45,000 Austrian children for six weeks. The children, it is declared by medical men, will either perish outright or grow up weaklings unless they get a change and proper food.

Jewish Memorial Hospital to Move.—The Jewish Memorial Hospital, formerly the Philanthropin Hospital, has purchased the Inwood House at 202nd Street and Broadway, New York. This institution will be renovated to accommodate 150 patients and is expected to be open by June 1, 1921, when it will demonstrate the possibilities of an open hospital.

Vera Cruz Port to Reopen.—The port of Vera Cruz has been reopened under a modified quarantine against bubonic plague. Regulations were drawn up by Dr. Carl Michel, of the U. S. Public Health Service, and Mexican health authorities. A campaign against yellow fever will be begun at Vera Cruz under the advisory supervision of Dr. Michel, along the lines of the United States campaign in Cuba and Panama.

Royal College of Surgeons Fellowship to Americans.—The Honorary Fellowship of the Royal College of Surgeons was formally presented on July 8th to four distinguished surgeons: Professor John Finney, of Johns Hopkins University; Dr. Charles H. Mayo, of Rochester, Minn.; Professor A. Depage, of Brussels, and M. Pierre Duval, of Paris.

School of Röntgenology.—The special committee of the New York Association for Medical Education has drawn plans for a course of instruction in röntgenology. The July 15th *Bulletin* of the Association states that one of our universities has expressed a willingness to open and develop such a department; one of the leading physicists of the country and a staff of the best röntgenologists of New York have agreed to serve as a teaching body and that provision of a comparatively small sum of money to purchase equipment and start the work is all that is necessary to launch this excellent and sorely needed new department of medical education.

American Hospitals in Near East.—An American hospital of one hundred beds has been established in Stamboul, the Turkish section of Constantinople. Dr. A. R. Hoover, a resident of Turkey for many years, will be the director, and Dr. Elfie Richards Graff, formerly physician to Vassar College and a member of the Wellesley unit of the American Committee for Relief in the Near East, will be his assistant. Equipment for the hospital will be supplied by the American Red Cross and the personnel by the Red Cross and the American Committee for Relief in the Near East. Constantinople College for Women will open a school for nurses in connection with the hospital and within a year will open a woman's medical college.

An open air hospital for tuberculous children has also been established on the shores of the Bosphorus, a few miles north of Constantinople, under the direction of the American Committee for Relief in the Near East. Dr. Elfie Richards Graff is the director.

Died.

ALTHANS.—In New York, N. Y., on Tuesday, August 3d, Dr. Charles H. Althans, aged eighty-three years.

ASHER.—In New Orleans, La., on Monday, July 5th, Dr. Philip Asher, aged fifty-three years.

BORNIO.—In New Orleans, La., on Saturday, July 17th, Dr. Domingo Bornio, aged sixty years.

FURTFNEY.—In Orosi, Cal., on Wednesday, July 21st, Dr. Henry Furtney, aged sixty-three years.

HENRY.—In Lecompte, La., on Wednesday, July 7th, Dr. Eugene L. Henry, aged forty-six years.

LEWIN.—In Buffalo, N. Y., on Saturday, July 31st, Dr. William C. Lewin, aged fifty-seven years.

LEWIS.—In Harrington, Del., on Sunday, August 1st, Dr. Beniah L. Lewis, aged seventy-two years.

MCVEA.—In Baton Rouge, La., on Monday, July 5th, Dr. Charles J. McVea, aged fifty-one years.

MEIERHOF.—In New York, N. Y., on Thursday, August 5th, Dr. Harold Lee Meierhof, aged twenty-six years.

MOYER.—In Lansdale, Pa., on Tuesday, August 3d, Dr. Samuel C. Moyer, aged seventy-four years.

ROBIN.—In New Orleans, La., on Saturday, July 10th, Dr. Ernest A. Robin, aged fifty-one years.

SEVERANCE.—In Keeseville, N. Y., on Wednesday, July 28th, Dr. Karl J. Severance, aged fifty-four years.

Book Reviews

LOCAL ANESTHESIA.

Die örtliche Betäubung, ihre wissenschaftlichen Grundlagen und praktische Anwendung. Ein Handbuch und Lehrbuch. Von PROF. DR. HEINRICH BRAUN, Geh. Medizinalrat, Direktor des Krankenhauses in Zwickau. Fünfte, ergänzte und teilweise umgearbeitete Auflage. Mit 208 Abbildungen. Leipzig: Johann Ambrosius Barth, 1919. Pp. xvi-507.

This fifth edition contains two new chapters dealing with operations on the throat and on the vertebral column and thorax. In the chapter on throat operations, the most extensive operative procedures are described, including strumectomy, laryngectomy, adenectomy, and resection of the pharynx and esophagus under conductive local anesthesia. The details of paravertebral anesthesia are given in the chapter on thoracic surgery and it promises to be of great value in abdominal operations. Breast cancers may be removed under local anesthesia. The chapters on operations of the abdomen and on the genitourinary organs and rectum have been rewritten and the whole work has been brought up to the minute in conformity with the most modern practice.

The first half of the book deals with the history, theory and physiological principles of local anesthesia, the use of cocaine and its toxicology, and also of the other local anesthetics, such as tropacocaine, eucaine, holocaine, the orthoform group, stovaine, alpine, novocaine, phenol, quinine and urea hydrochloride, and other preparations not so well known or used in this country. The author prefers the use of novocaine with adrenalin as the most useful of them all. The various methods of local anesthesia are described in detail. It is the author's opinion that the belief that children and nervous adults are not amenable to local anesthesia is no longer tenable because of the improved modern technic. He has operated upon children four years old under local anesthesia with the aid of cajolery and bribery. The indications and technic of infiltrative and conductive anesthesia are fully described.

The illustrations are profuse and illuminating, in many cases being actual photographs of operative field. The bibliography is most exhaustive and up to date. On the whole, the book is a valuable adjunct to the armamentarium of the general surgeon and the specialist, and of distinct value as an aid to the student.

HEREDITY.

Heredity and Social Fitness. Study of Differential Mating in a Pennsylvania Family. By WILHELMINE E. KEY. With Charts. Washington, D. C.: Carnegie Institute, 1920. Pp. 102.

More than a century ago, there came to Western Pennsylvania a German with his wife and three children, and about the same time, three married German brothers. They all acquired land there seemed no obstacle to their proving a blessing to their adopted country. Some have; but tracing the defectives, as they drifted from place to place in Pennsylvania, these have been found to constitute the dregs of every community. The author has undertaken the tremendous task of tracking some 1,822 members of the two families, not with a view to exhibit her

talent for such research or to prove the depravity of man, but simply to show how the histories of the various branches affect the immigration problem of today, and how far these two branches assimilated and amalgamated, seeing they were planted in a progressive, pioneer community where democratic ideals prevailed and opportunities for education were fair. There was amalgamation, but, then as now, the defective members married defective natives or incoming immigrants, while the superior ones had wives from the better native strains. The modern inrush of immigrants meets conditions far less favorable than it did a century ago; Ellis Island, after all, can only judge superficially, and the need for colonization schemes for the unfit is increasing. The author suggests five main remedial measures: segregation and even sterilization of the grossly defective; state control of marriage through a eugenics board; Federal control of immigration; creation of an enlightened public sentiment in favor of eugenic mating, and eugenic education of prospective couples. All this ought to be supplemented by studies abroad to prevent the transplanting of strains seriously defective, and by studies here to secure the locating and registration of the increasingly unfit. One reads of vital statistics, and the reader of this book will find the facts very alive, very impressive, even tragic, not inclining the flippancy to say with the Irishman, "What has posterity done for me that I should do anything for posterity?"

LEONARD MERRICK.

When Loves Flies Out o' the Window. By LEONARD MERRICK. With an Introduction by W. ROBERTSON NICOLL. New York: E. P. Dutton & Co., 1920. Pp. x-309.

The Worldlings. By LEONARD MERRICK. With an Introduction by NEIL MUNRO. New York: E. P. Dutton & Co., 1919. Pp. v-334.

Leonard Merrick is a writer who for a long time was not appreciated by anyone but the literary critics and who is now being pushed into public favor by the cumulative acclaim of his fellow craftsmen. His works are being brought out in a new American edition with prefaces by various writers attesting to Mr. Merrick's artistry, and the public is finding out that in spite of this they are splendid entertainment. Merrick's stories—and the two novels mentioned are preeminently stories—are light in theme, expert in workmanship, and disillusioned in mood. There is no padding in them and no undigested psychology. They might be used as models for college courses in composition.

Mr. Merrick is most at home in the theatrical and literary worlds and his novel *When Love Flies Out o' the Window* bears the earmarks of experience. There is more than a touch of irony in his depiction of the noted author who was lauded by all the critics but whose sales did not warrant his publishers advancing fifty pounds on account. He knows, too, the precarious life of the chorus girl—one day with an engagement, the next without—and the hopelessness which makes her snatch at any sort of chance. *When Love Flies Out o' the Window* details the story of a stranded writer and a stranded singer—how he rescued her from the cab-

aret in Paris where she was singing, how they were married on the strength of the two guineas weekly furnished by his *causerie* for a London paper, and how the two guineas suddenly stopped. Mr. Merrick has done a fine piece of work in the portrayal of Lingham's endeavor to prevent his wife's returning to the stage, of his struggle when circumstances finally compelled her to, and of the bitterness which caused their parting—all because Lingham could not see her as a comrade to share the downs as well as the ups of their economic life. The book is written with a fine economy of means: there is not an unnecessary incident to mar the course of the narrative, not a shade too much interest on the part of the author in any one character or situation, and the happy end is not an afterthought.

The Worldlings is a melodrama in which the hero and the villain are the same person. There is nothing new about the theme—the impersonation of the prodigal son by an adventurer who succeeds in his bluff, marries the beautiful daughter of a neighboring countess, and is discovered only because his partner in the plot turns upon him. But Mr. Merrick's people are not thus easily disposed of: they cannot be sharply separated into the sheep and the goats. The original prodigal son is a waster, and the man who takes his place is a rather fine fellow who had neither the luck nor the hard-headedness to succeed in life. The countess's daughter is a cool, artificial beauty, but when the veneer cracks she is much the same as other women. Even Blake's fellow plotter is moved by much the same springs of ambition as distinguish more laudable enterprises. *The Worldlings* should appeal to many readers. Those who demand incident will find it a compact, quickly moving story which holds the interest from cover to cover, while those who can see beyond the plot will admire the skill with which Mr. Merrick has clothed a conventional theme with the flesh and blood of reality.

WAR NEUROSIS IN FICTION.

Peter Jameson. By GILBERT FRANKAU. New York: Alfred A. Knopf, 1920. Pp. i-431.

Gilbert Frankau's novel fulfills the requirements of the postwar fiction readers. It describes the war not too attractively, yet not too uncomfortably, and the characters of the book are just such wholesome, fine individuals as the secretly self-discontented reader would like to be. The business man and woman will delight in reading of the adventures of a man, essentially a business man, who tottered on the brink of ruin because he answered the call of war, and yet just survived—not in his business, from which he escaped unscathed, however, but in his comfort and future. The longing for adventure and romance in business that has not found achievement in us, animates the pages, rendering the hero's tobacco industry so absorbing to him that his wife and family are forced into the background.

Returning from the war, a war neurosis victim, Peter Jameson has to pass through the conventional struggle of adjustment to a world where business has lost its urgency, where the human beings in the tale have a romance and value of their own. Peter's father-in-law, the skilled neurologist, is able,

by psychoanalysis to suspect and guide him through this period of adjustment, and the story ends with Peter's gratifying response to the call of the soil.

England, we foresee, is safe, with her sons returning to mother earth. This amateur farmer, probably because he knows his business, somehow succeeds on the large scale of his other business enterprises. Romance and adventure even though it be only in the growing of crops once more lend the scene a rosy glow.

NIETZSCHE.

The Antichrist. By F. W. NIETZSCHE. Translated from the German. With an Introduction by H. L. MENCKEN. New York: Alfred A. Knopf, 1920. Pp. vii-182.

Poor Nietzsche! How he hated those who included the word pity in their vocabulary and yet how can one help pitying him! The cause of this was the turn of circumstance, his ill fitting personality, a heritage of ministerial ancestors, and the curse of syphilis. No wonder he stood on the edge of the world and howled. With his inferiority which he strove to overcome his wit sharpened, and often while he was baying at the harmless moon he told of things we knew were true. He spoke of the moon's dull light and of how it differed from the sun. Many were struck by his obvious truths, others were convinced by his keen judgments and attempted to swallow his creed, but they found more condiment than meat in the dose.

We are indebted to Nietzsche for many bright and truthful sayings, boldly told. When we examine his bravery with a bit of care we find it no more than coward's courage. The only way his works can be read with profit is by an impartial separation of the grain from the chaff. All prejudice must be cast aside and we must soften our judgments and consider how he labored under many handicaps, ever seeking an external cause for his own misery and a reason for his insolvent soul. He found little good in man and even less, by his own confession, in woman. Had he looked more into his own egotistical being he would perhaps have found the causes for his shortcomings and refrained from damning the world, its inhabitants, and their ideas, even if many of them were erroneous and childish. We must also search for the motive of fear that prevented him from finding the good in man. Was it that he trembled at losing the protective armor that prevented him from coming into contact with his fellow man? Most likely.

With all this we owe the man a debt. Just as Napoleon's weakness led him on to a tremendous striving without peace to himself and to great creative achievements, so it was with Nietzsche. We cannot afford to cast him aside and let his little liked mannerisms keep us from the many fundamental teachings he left. It is only a question of realization that many beautiful flowers and useful foods owe their existence to manure. The difficulty is that few of us relish the task of the horticulturalist, especially when the fertilizer has a strong stench as of ground bone dust. We must not make the error of calling him Teutonic and carelessly cast him aside. He was of Polish origin. This should not influence us one way or another for the seekers after truth

have no scruples in borrowing their material wherever they find it.

Just what Menken's idea was in writing an elaborate preface is a bit difficult to determine. Perhaps he wished to identify himself with a really great man and immortalize himself by being bound into one volume with the pugnacious Nietzsche. He can best answer this himself, for he is still among the living.

O. HENRY PRIZE STORIES.

O. Henry Memorial Award Prize Stories 1919. Chosen by the Society of Arts and Sciences. With an Introduction by BLANCHE COLTON WILLIAMS. Garden City and New York: Doubleday, Page & Co., 1920. Pp. xvii-298.

This volume of stories has been selected as the best short stories that have appeared in American publications. Aside from the interest they offer and the pleasure one may get from reading carefully selected short stories they offer an added value in being a permanent index for reference of what American writers are doing. It is stated that there has been a dearth of short stories during the past year. This should be referred to as being relative, for in no country are there so many short stories written. The demands made by the numerous magazines are tremendous and they must be filled. The editors find it difficult to secure enough copy and yet keep a high standard. It may be well to amend the statement and say that the number of good short stories is limited, that the standard is none too high. It may seem strange where so many are being produced that so few are of a really high standard. In view of these facts it is commendable that we have a volume containing the cream of what has been produced.

Worthy of note are the prize story, *England to America*, by Margaret Prescott Montague, and the *Porcelain Cups* by James Branch Cabell. Cabell has come to the fore and he has received recognition from his much discussed *Jurgen*. He has great charm and more depth than is apparent at first glance, both from the material which he handles in a masterly way, material that he has culled from the literature little appreciated in America, and from the subtle irony which he weaves into his stories.

This is, indeed, a splendid book for vacation reading, or for whiling away an idle half hour. We are presented with stories of good workmanship, wide interests, and not too banal.

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

FAIRY TALES FROM FRANCE. Retold by WILLIAM TROWBRIDGE LARNED. Illustrations in Full Color. By JOHN RÆ. New York, Chicago, and Toronto: P. F. Volland Company.

TRAVAUX NEUROLOGIQUES DE GUERRE. Par GEORGES GUILLAIN, Professeur agrégé à la Faculté de médecine de Paris; Médecin de l'hôpital de la Charité; et J. A. BARRÉ, Professeur de Neurologie à la Faculté de médecine de Strasbourg. Préfacé de Professeur PIERRE MARIE. Paris: Masson & Cie, 1920. Pp. xii-463.

WHEN LOVE FLIES OUT O' THE WINDOW. By LEONARD MERRICK. With an Introduction by W. ROBERTSON NICOLL. New York: E. P. Dutton & Co., 1920. Pp. x-309.

BARNES UTSÅTTANDE FÖR TUBERKULÖS SMITTA. AV EMANUEL BERGMAN; Medicine Licentiat av Göteborgs Nation. Uppsala: Appelbergs Boktryckeri Aktiebolag. Pp. vii-126.

GENERAL PSYCHOLOGY. By WALTER S. HUNTER, Professor of Psychology, University of Kansas. Illustrated. Chicago: The University of Chicago Press. Pp. xiii-351.

NUEVAS, ORIENTACIONES SOBRE LA PATOGENIA Y TRATAMIENTO DE LA DIABETES INSIPIDA. Par Dr. GREGORIO MARAMON, de Hospital General. Madrid: Editorial Saturnino Calleja, S. A., 1920. Pp. xiii-174.

RADIOGRAPHY IN THE EXAMINATION OF THE LIVER, GALL-BLADDER, AND BILE DUCTS. By ROBERT KNOX, M. D., Hon. Radiographer, King's College Hospital, London. A Series of Articles Reprinted from *Archives of Radiology and Electrotherapy*. Illustrated. St. Louis: C. V. Mosby Company, 1920. Pp. i-64.

A MANUAL OF NEURASTHENIA. (Nervous Exhaustion.) By IVO GEIKIE COBB, M. D., M. R. C. S., Neurologist, Ministry of Pensions; Late Assistant to Out Patient Physician, the Middlesex Hospital; Formerly Neurologist, Brinnington Section, Second Western General Hospital. New York: William Wood & Co., 1920. Pp. xvi-366.

X RAY OBSERVATIONS FOR FOREIGN BODIES AND THEIR LOCALIZATION. By Captain HAROLD C. GAGE, A. R. C., O. I. P., Consulting Radiographer to the American Red Cross Hospital of Paris; Radiographer in Charge, Military Hospital V. R. 76, Ris Orangis, and Complementary Hospitals. Illustrated. St. Louis: C. V. Mosby Company, 1920. Pp. i-83.

EPIDEMIC ENCEPHALITIS. (Encephalitis Lethargica.) By FREDERICK TILNEY, M. D., Ph. D.; Professor of Neurology, Columbia University; Attending Neurologist, the Presbyterian Hospital and the New York Neurological Institute; Consulting Neurologist, Roosevelt Hospital, New York, and HUBERT S. HOWE, A. M., M. D.; Instructor in Neurology, Columbia University; Assistant Visiting Neurologist, the Presbyterian Hospital, New York. Illustrated. New York: Paul B. Heeber, 1920. Pp. xv-252.

DISEASES OF CHILDREN. Presented in Two Hundred Case Histories of Actual Patients Selected to Illustrate the Diagnosis, Prognosis and Treatment of the Diseases of Infancy and Childhood, with an Introductory Section on the Normal Development and Physical Examination of Infants and Children. By JOHN LOVETT MORSE, A. M., M. D.; Professor of Pediatrics, Harvard Medical School; Visiting Physician at the Children's Hospital, and Consulting Physician at the Infants' Hospital and at the Floating Hospital, Boston. Third Edition. Illustrated. Boston: W. M. Leonard, 1920. Pp. v-639.

ORAL SURGERY. A Treatise on the Diseases, Injuries, and Malformations of the Mouth and Associated Parts. By TRUMAN W. BROPHY, M. D., D. D. S., LL. D., Sc. D., F. A. C. S., President and Professor of Oral Surgery, Chicago College of Dental Surgery; Oral Surgeon to St. Joseph's, Michael Reese, and other Chicago Hospitals; Consulting Oral Surgeon to the Presbyterian Hospital, etc. With Special Chapters by MATTHEW H. CRYER, M. D., G. HUDSON MAKUEN, M. D., WILLIAM J. YOUNGER, M. D., F. W. BELKNAP, M. D., CALVIN S. CASE, M. D., D. D. S. With Nine Hundred and Nine Illustrations, Including Thirty-nine Plates in Colors. Philadelphia: P. Blakiston's Son & Co., 1918. Pp. xvi-1090.

TRAITÉ D'ANATOMIE HUMAINE. Par P. POIRIER-A. CHARPY. Nouvelle édition Entièrement Refondue. Par A. NICOLAS, Professeur d'Anatomie à la Faculté de Médecine de Paris. Avec la Collaboration de MM. O. AMOEDO, ARGUAD, A. BRANCA, R. COLLIN, C. GUNEO, G. DELAMARE, PAUL DELBERT, DIEULAFE, A. DRUAULT, P. FREDET, GLANTENAY, A. GOSSET, M. GUIDE, A. HOVELACQUE, P. JACQUES, A. PRENANT, H. RIEFFEL, ROUVIÈRE, CH. SIMON, A. SOULIE, B. DE FRIESE, WEBER, Tome Deuxième, Troisième Fascicule Angéiologie. Capillaires: P. JACQUES (revision R. Arguad). Développement des veines: A. HOVELACQUE. Système veineux: A. CHARPY (revision A. Hovelacque). Structure des veines: P. JACQUES (revision R. Arguad). Veines: A. CHARPY (revision A. Hovelacque). Troisième édition Revue. Avec 99 Figures dans le Texte, en Noir en Couleurs. Paris: Masson et Cie, Pp. i-278.

Miscellany from Home and Foreign Journals

General Anesthesia with Ethyl Chloride in Fractional Amounts.—Paul Lutaud (*Journal de médecine de Paris*, January 20, 1920), from experience in war surgery, comments on the disadvantages of ether, chloroform, anesthetic mixtures, and other procedures, in particular as regards slowness of induction, ten or fifteen minutes always elapsing before the operation could be started. Ethyl chloride is highly advantageous in this and other respects, but as applied hitherto, yields only a brief anesthesia. Lutaud uses a metallic mask of medium size, closely adjusted to the face with an inflatable rubber margin, and provided within with wire netting to which gauze is fastened, and above with a small funnel shaped projection, open at the top and communicating with the interior of the mask. The mask is placed in firm contact with the face, the patient directed to breathe out completely two or three times, and an ordinary ethyl chloride or kelene tube passed into the funnel shaped opening. The stream of ethyl chloride moistens the gauze within. Anesthesia is generally obtained in one minute; the ethyl chloride tube is then removed and the funnel shaped opening closed with the finger tips. For prolonged anesthesia only about one-fifth of a twenty mil tube of anesthetic is at first used. The anesthetist then closes the opening, while keeping the mask firmly against the face, and later renews the dose of ethyl chloride according to requirements. With this procedure the patient shows much less cyanosis than where a larger amount is used at the outset, and the anesthesia can readily be kept up for ten or fifteen minutes, a little air being allowed between successive doses of the anesthetic, provided, however, complete resolution has been obtained at the outset. Under this type of anesthesia the author removed over a thousand projectiles with the x ray screen, and did several hundred operations on wounds, including short bone operations, such as compound fractures and ligations. In abdominal work the incision was made under ethyl chloride, the abdominal cavity explored, and the anesthesia then discontinued during such maneuvers as intestinal suture, being later resumed for closure of the incision. A gastrostomy, two gastroenterostomies, two artificial anus operations, acute and chronic appendicitis procedures, and even removal of a malignant ovarian cyst in a countrywoman, were successfully performed under ethyl chloride.

Pyelotomy and Nephrectomy.—Daniel N. Eisendrath (*Annals of Surgery*, June, 1920) from a study of the variations and anomalies of the renal vessels suggests the following changes in operative technic:

1. During nephrectomy or even nephrotomy the poles of the kidney should be most carefully exposed. The mobilization of the kidney should be gradual, care being taken both at the lower and upper poles never to tear or divide adhesions or strands of fibrous tissue before they have been inspected and also palpated (for a possible pulsation) to exclude the presence of a supernumerary

vessel. I have found the suggestion of Kolisher an excellent one, namely, to divide the ureter in nephrectomy before attempting to mobilize the kidney.

2. In pyelotomy one must bear in mind the anomalies of the retropelvic vessels which I believe have been reported for the first time in this paper. Careful exposure of the pelvis before the incision for delivery of a calculus is made will greatly lessen the chances of encountering an anomalous vein or artery.

Treatment of the Acute Abdomen.—J. P. Runyan (*Southern Medical Journal*, February, 1920) has formulated the following conclusions from the answers received to a questionnaire sent to a number of prominent surgeons:

1. It is a safe and sane procedure to operate early in an attack of acute suppurative peritonitis.

2. After the stage of contamination comes the stage of diffuse peritonitis, in which the Ochsner treatment offers the largest proportion of recoveries.

3. The exceptions to rule two are perforation of duodenal ulcer and gunshot wounds of the hollow viscera.

4. Do not hurry too much to operate once the Ochsner treatment has been started.

5. Following the Ochsner treatment, an operation should be done and Crile's principles applied in the aftertreatment of all cases of septic peritonitis.

6. Where there are large areas of denuded peritoneum, from which may be expected a considerable flow of pus and serum, gauze drainage after the manner of Mikulicz or Price may be expected to give the most satisfactory results.

7. In cases in which no peritoneal denudation has occurred, rubber tube drains will suffice.

Amputation of the Leg.—O. Borchgrevink (*Annals of Surgery*, June, 1920) describes the operation which he follows for the amputation of the leg as follows:

From a point eight cm. above the line where the tibia is to be divided, make a longitudinal incision through the skin and superficial fascia three cm. behind and parallel with the fibula. The incision is curved forward above the head of the fibula. Place clips on the edges of the superficial fascia. Divide the peroneal nerve behind the head of the fibula, expose it upward; reflect its divided end and push it upward behind the biceps tendon. Divide the tendon of the biceps and the collateral fibular ligament as close to the fibula as possible without injuring its periosteum. Open the tibiofibular joint and free the head of the fibula, which is removed after division of the neck of the bone. Do not injure the insertion of the biceps tendon into the external tuberosity of the tibia. To prevent injury of the anterior tibial artery and vein, expose them at their passage under the fibula. Separate the interosseous membrane from the shaft of the fibula. Be careful neither to injure its periosteum nor the main vessels.

Divide the fibula at the lower end of the incision. From the inner and front side of the leg make a flap consisting of skin and superficial fascia. The flap must at least be five cm. longer than the diameter of the leg at the joint chosen for the division of the tibia. At the same level join the upper ends of the flap incision by a horizontal incision around the outer and posterior part of the leg. Divide the fibula two to three cm. above the last incision. Treat both ends of the left piece of the fibula according to Hirsch-Bunge. Divide the muscles at the line chosen for the section of the tibia. Divide the tibia and remove its periosteum and marrow for one and five tenths to two cm. upward. With the standing patient the sawn surface of the tibia must form accurately a horizontal plane. Its edges should be rounded with a file. Every point of the end of the tibial stump must bear, and bear equally much. Carefully close the incision of the superficial fascia by a separate catgut suture. Only when the leg stump has a length of at least fifteen cm. there can become a question of leaving a piece of the fibula.

In case of reamputation the fibula is removed in the way above described. If the stump is nonend-bearing, a part of the tibia if sufficiently large for treatment, according to Hirsch-Bunge, is amputated. If the stump is covered with healthy and movable skin and superficial fascia, these should be separated from the bone, but otherwise left as they are. Has the end of the stump a tender and immovable scar, an amputation is sufficient for the covering of the stump with superficial fascia and normal skin is necessary.

Intravenous Injections of Pancreas Emulsions in Experimental Diabetes.—Israel S. Kleiner (*Journal of Biological Chemistry*, November, 1919) administered to dogs rendered diabetic by depancreatization slow intravenous injections of unfiltered water extracts of fresh pancreas, diluted with 0.9 per cent. sodium chloride solution. In nearly all the experiments a substantial reduction in the blood sugar occurred lasting from half an hour to an hour and three quarters. There was also a diminution in the excretion of sugar in the urine. Controls of other gland extracts failed to produce similar results. The author believes that his experiments support the internal secretion theory of experimental diabetes and also thinks that the pancreas emulsions might be used as a therapeutic agent in human beings, although more work will have to be done on this problem before such injections can be carried out safely.

The 1918 Pandemic of Influenza in Canton.—William W. Cadbury (*China Medical Journal*, January, 1920) says that three definite epidemics of influenza appeared in Canton during the spring, fall, and winter of 1918, coinciding in time with the appearance of the disease in Europe and America. In Canton foreigners were but slightly affected. The spring epidemic was mild, the fever lasting but two to four days; the second and third epidemics were more severe, the fever usually lasting four or five days and complicated in some cases by pneumonia. Males suffered more than females. At the Christian College, Canton, the majority of the patients were

boys between eleven and twenty years of age; the older students, the faculty, and the servants were affected in relatively much smaller numbers. Leucopenia was generally present. The fever curve often presented two high peaks from one to four days apart. One attack of the disease tended to immunize against further attacks. The disease tended to run through a household, affecting every member. The mortality in Canton was low.

Injection of Cow's Milk in Ocular Infections.—D. S. Garcia Mansilla (*Revista de Medicina y Cirugia Practicas*, December 14, 1919) states that this method of using cow's milk by injection was first used by Müller and Thanner in Vienna in 1916, not only for the treatment of ocular infections but also general infections such as influenza, bronchopneumonia, gonorrhoea, and articular rheumatism. The eye infections where the method has been found of value are acute iritis, infected ulcers of the cornea, postoperative infections, purulent ophthalmia, trachoma, and eczematous keratitis. The injections are given intravenously, subconjunctivally, or intramuscularly; the quantity being about five c.c. and the interval averaging two days.

Icebox Fixation Method in the Performance of the Wassermann Reaction.—R. G. Owen and F. A. Martin (*Journal of Laboratory and Clinical Medicine*, January, 1920) believe that a simple alcoholic extract of human heart with the first phase of the reaction carried out at 7 to 10° C. for four to six hours gives the most reliable Wassermann results. Like other observers, they obtained false positives in a considerable number of cases when cholesterinized antigens were used. The sera from 1,113 patients was examined with plain antigen at 7 to 10° C. fixation for four hours, and with incubation at 37.5° C. for one hour with both plain and cholesterinized antigen. Fewer doubtful reactions were obtained by the icebox fixation method than with the older methods.

Dislocation of the Shoulder Joint and Its Treatment.—Alan H. Todd (*Practitioner*, March, 1920) asserts that the present aftertreatment of dislocations of the shoulder by fixation of the arm to the side is irrational, unscientific, and unsuccessful, resulting in limitation of abduction and osteoarthritis. In rectangular abduction the rent in the capsule is closely coaptated, whereas in adduction the capsule is crowded together in a crinkly lump and coheres in that position, thus limiting abduction and causing pain. The arm is no more likely to redislocate when placed in rectangular abduction than when it is tied to the side. If abduction is adopted, the resulting movements are much better; they are obtained much more quickly and less painfully.

New Treatment of Chronic Suppurating Otitis with Dakin's Solution.—D. A. Ramos Acosta (*Revista de Medicina y Cirugia Practicas*, January 28, 1920) has found that Dakin's solution is an excellent agent for the rapid cure of chronic suppurating ears. Having eliminated all nasopharyngeal causes of ear discharge, this method should be the one of choice; further, it has no contraindications. To avoid irritation of the auricle it should be anointed with vaselin.

Proceedings of National and Local Societies

MEDICAL SOCIETY OF THE STATE OF
NEW YORK.

*One Hundred and Fourteenth Annual Meeting,
Held in New York, March 23 to 25, 1920.*

The President, Dr. CLAUDE C. LYTLE, of Geneva, in the
Chair.

(Continued from page 1054, Vol. CXI.)

SECTION IN SURGERY.

Abdominal Incisions.—Dr. CHARLES W. HENNINGTON, of Rochester, stated that there was still a great difference of opinion in reference to abdominal incisions. The final decision as to which was best would be reached by a further study of the normal healing of tissues. In general, the location and direction of the incision ought to be determined by its effect on the muscles and innervation. The approach to this question depended upon anatomical and embryological considerations. He felt that many of the objections recently raised to the McBurney incision would vanish if attention were paid to the complete and orderly separation of the layers. Whether the high or low McBurney incision was to be employed must be determined by examination and final palpation when the patient was under the anesthetic. The low incision was preferable, in his opinion, as it gave better access to the abdomen. The occurrence of hernia after the McBurney incision was due to needless destruction of the innervation. The other lateral incision was that through Petit's triangle, with a similar spreading of the muscles. This afforded a good approach to the retroperitoneal appendix and to the kidneys and ureter. This incision had the advantage that it admitted of excellent closure and disturbance of the innervation could be avoided with moderate care. The transverse incision had been slow in gaining favor, and justly so, in his opinion. Although the transverse incision permitted a wider exposure, the muscle fibres of the rectus muscle were longitudinal; furthermore, the transverse incision did not readily lend itself to enlargement of alteration, and the difficulties of closure outweighed those encountered when the muscle was divided longitudinally. The best way of closing the transverse incision was by the crossbuck mattress suture. The best approach to the lower abdomen was by the classical longitudinal midline incision. There was of course, greater danger to the innervation from a long than from a short incision. The toxicity absorbed might be just as great from a short incision as from a long one. A wound with bruised edges, even if short, might give a greater degree of toxicity than a long one with clean, unbruised edges. In closing any incision, emphasis was to be laid on the exact approximation of similar structures. The explanation of painful scars was dependent upon one of two factors, the inclusion of nerves in the scar, or traction produced by tension on the scar. He had had a special opportunity of observing scars in France, as where he was located, a considerable number of soldiers had

been sent back from base hospitals because of painful abdominal scars, and these men proved a serious problem. It was a question whether they could be sent back as Class A men. Many hernia operations had been done in camps in the United States and it would be interesting to know the exact proportion of these men who were really fitted for Class A military service. He was confident that a large number of these repairs had failed to make Class A men, and he thought they should be placed in Class B limited service. The fact that many men who had had operations for hernia, as well as those having undergone other abdominal operations, complained of painful scars gave weight to the idea that excessive scar formation was to be avoided. In closing an abdominal wound, the aim should be not merely the avoidance of hernia but actual normal anatomical and physiological restitution of the abdominal covering.

The Symptomatology of Perforated Duodenal Ulcer.—Dr. ROBERT S. MACDONALD, of Plattsburg, said that of all the acute abdominal catastrophes, perforated duodenal ulcer was the most painful. In subacute and chronic perforations there was a gradual increase in the symptoms, but in acute perforation the onset was absolutely sudden and the signs pointed toward the duodenum. In non-perforating duodenal ulcer the symptom complex was so complete that, as Doctor Deaver said, the diagnosis could be made over the telephone. In the typical duodenal case there was a history of gastric disturbance extending over a series of years, and often a history of a feeling of fullness in the chest, with eructation of gas, corrected to a certain extent by alkalies. In point of time it was important to remember that the distress occurred several hours after meals and was worse at night; food seemed to relieve the distress. There was a typical loss of weight, mostly in the spring and fall. Vomiting and hematemesis or blood in the stools occurred in eighty per cent. of the cases. There were gastric hyperacidity and hyperperistalsis, and often there was a too rapid expulsion of the barium if no obstruction was present. In many cases the time when perforation would occur could be predicted with considerable accuracy. The anatomical location of the perforation was uncertain. At the time of perforation it was frequently impossible to tell whether it was in the stomach or the duodenum. Often the right side was affected more than the left and this might lead to a mistaken diagnosis of appendicitis, gallstones, or renal colic. The site of the ulcer seemed to make no difference as to the probability of perforation. C. H. Mayo reported 2113 cases of all types, in 84.9 per cent. of which the perforations were duodenal and in 15.1 gastric. The statistics of the Massachusetts General Hospital showed that sixty-nine per cent. of the perforations were duodenal, while Dr. Charles L. Gibson reported that in his cases the majority of perforations were gastric. Doctor Stanton reported seventy per cent. gastric perforation. Of his own ten cases,

three were gastric, five duodenal, and two were in the pyloric area. There was an interval between the early crisis and the later rigidity when it might be possible to get some idea as to the location of the perforation. He felt convinced that seventy per cent. of perforations would be found to occur in the duodenum. The greatest aid in diagnosis was afforded by a well recorded history and a series of x ray findings.

Diagnosis of Cholecystitis and Indications for Cholecystectomy.—Dr. ALEXANDER E. GARROW, of Montreal, said a patient might give a history of cholecystitis and yet the gallbladder show little evidence of disease either to the eye or by palpation. Often such a gallbladder when opened may show a typical strawberry mucous membrane. Frequently the peritoneum in the region of the colon may show hyperemia, and there may be enlargement of the lymph glands in the vicinity of the gallbladder. In fact it might be said that contiguous disease often offered a better criterion for the removal of the gallbladder than the appearance of the organ itself. The evidence seemed to show that inflammation of the gallbladder was infective in origin. We had been taught that infection probably occurred through the bile or from the duodenum by way of the common duct. Drainage of the gallbladder had seemingly benefited a number of patients, but he doubted whether the good results were due to drainage *per se*; probably they were due to rest and the withdrawal of a small amount of bile. Appendicitis, ulcer of the stomach and duodenum, and cholecystitis were largely of embolic origin. Rosenow had shown the selective affinity of the streptococcus for this region, and the bile might be sterile though the wall of the gallbladder was infected. He agreed with those who held that cholecystectomy was the operation of choice, even though there was little pathology limited to the gallbladder itself. When there was a clinical history of recurrent attacks or of a chronic type of inflammation, it was safe to assume the presence of an infective process which became active when the resistance of the body was lowered. Doctor Garrow described various types of cholecystitis and spoke of the difficulty in some instances of differentiating it from duodenal ulcer.

In differentiating perforated duodenal ulcer from acute cholecystitis it might be well to remember that retraction of the abdomen was never seen except in duodenal ulcer. Fever in acute cholecystitis varied with the acuteness of the infection; chills were unusual, being rather more frequent in common duct infection; routine examination of the blood showed a leucocytosis; frequent vomiting was not usual. The indication for the treatment of an acute attack of cholecystitis was drainage, provided bile was found; as long as the bile drained away one might look for recovery, but in many of these cases treated by drainage there were sequelæ and hence many surgeons preferred cholecystectomy. The gallbladder was not essential to life, though it might be a factor in the well being of the individual. The symptoms of chronic cholecystitis were a distressing sensation in the epigastrium, pain beneath the right scapula and over the eighth, ninth

and tenth ribs, a bad taste in the mouth in the morning, and loss of appetite; some individuals were thin and others obese. Inspection of the abdomen was negative, but usually there was marked pain on deep pressure in the gallbladder region. Examination of a test breakfast showed about normal acidity. The gastric symptoms had no direct relation to meals and usually occurred late at night. These patients were often quite comfortable for weeks between attacks. In the ordinary chronic forms of cholecystitis the gallbladder was thickened, milky white in color, and tenderness and rigidity were present; occasionally there was a tumor when the cystic duct was obstructed. Doctor Garrow reported a series of eighty patients operated on for gallbladder disease during the past two years; of these sixty were women. The average age was forty-four and a half years. In forty-five the chief symptom was sour stomach; fifty vomited; twenty-seven were jaundiced; only eleven showed definite rigidity; forty had stones in the gallbladder. A reliable followup was conducted which showed that one had recurrence of symptoms.

Letters to the Editors.

DR. BENJAMIN RUSH.

CHICAGO, July 28, 1920.

To the Editors:

Dr. S. Adolphus Knopf is in error in assuming that Benjamin Rush was the founder of Rush Medical College. Benjamin Rush died in 1813. He was the greatest physician of the five medical signers of the Declaration of Independence, and the first and one of the greatest of American alienists. His work *On the Mind* is still quoted by the foremost European alienists. Next to Chiarrugi and Pinel he was the greatest reformer of the treatment of the insane. Dwight in his *Lives of the Signers* says of Rush: "Although in the political department in which he was called to act there was nothing that furnished occasion for splendid achievements, yet the services he rendered to the country were numerous and valuable; and not less so for being of that humble, unobtrusive character which will not necessarily emblazon his name on the pages of history. With the ardent feelings of an enlightened and inflexible patriot, he espoused the cause of his country, and, with a zeal worthy of such a character, he devoted his best talents to the promotion of its highest interests. And while he is esteemed as a benefactor of mankind, in the valuable contributions he has made for improving and advancing the medical sciences, he will be esteemed no less so by future generations who will learn his real merits from history, for the benefits he conferred on his fellow citizens, in the valuable services he rendered his country as a politician and a statesman." As a statesman, a patriot, a clinician and an alienist Benjamin Rush peculiarly deserves a place in the Hall of Fame.

Very sincerely,
JAMES G. KIERNAN, M. D.

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Original Communications

A WORD TO THE GENERAL PRACTITIONER ABOUT THE HANDLING OF EYE CASES.*

By EDWIN B. MILLER, M. D.,
Philadelphia,

Associate in Ophthalmology, Temple University; Assistant Professor of Ophthalmology, Graduate School, University of Pennsylvania; Ophthalmologist to Roosevelt Hospital.

There are two reasons for presenting a paper of this character. First, fifteen or twenty years ago the medical student received a very inadequate course in ophthalmology. Most of these men are poorly equipped to handle eye cases and are so engrossed with their daily tasks that they spend little or no time in study. Therefore, we receive frequent inquiries in reference to the treatment of eye diseases and we see many cases in private practice and in the dispensaries which have not been properly diagnosed and treated. Secondly, while students nowadays receive a fairly comprehensive course, by the time they get into practice they seem to forget a large part of their teaching, as is evidenced by the way in which many of their eye cases are treated and by conversation with patients who have been under their care. If, therefore, this paper will enlighten the first class and refresh the memory of the second, it will be of service to both physician and patient.

RELATIONSHIP BETWEEN THE SPECIALIST AND THE GENERAL PRACTITIONER.

It is often difficult to send patients to a specialist, and probably not one in five go after they are sent, the fear of an excessive fee usually being the factor which keeps them from going. The fault lies with both the general practitioner and the specialist. The medical man does not attach enough importance to such an examination and frequently uses it for moral support only while the specialist often overestimates the value of his services. Both must play fair to each other and to the patient.

I am perfectly sure that many general practitioners hold on to cases which they do not fully understand too long before referring them to a specialist. Many patients have asked me, "Why did not the doctor send me to you sooner?" Sometimes this places us in an embarrassing position and we give evasive answers, but it is still perfectly obvious to the patient that, had an early diagnosis been made

and appropriate treatment given, it would have saved him time, money and discomfort. I have, on the other hand, had patients say to me that they appreciated the promptness of their physician in sending them to a specialist and he would not lose anything by it. I believe it pays to be perfectly frank and open and above board with your patients. I do not believe it does any harm to tell patients that you do not know what is the matter with them but will study up their cases, or call in a consultant, or refer them to someone in the line of work in which you think their case belongs.

There are, however, two sides to every question and many men who profess to be specialists violate the code of medical ethics and take advantage of the general practitioner. I have had men tell me that when they send a patient to a specialist they never see him again. When I was doing general work, I sent patients to specialists who treated them for other conditions which I could have done just as well. I sent a woman to a gynecologist; she was under treatment for some months. She told me she had had two attacks of tonsillitis while under his care and he treated her for it; when I questioned him he said she was in the office and he thought he might as well treat her, admitting that he had forgotten I had sent her to him. That was all wrong and needless to say he received no more of my work. If it is an eye case and the sinuses need looking into, the man who sent the patient should at least be asked to suggest a nose specialist or should be informed of the condition.

We can avoid such tendency toward forgetfulness by having on our cards the name of the doctor who referred the case to us. Even when patients are sent me by opticians, I try to find out who is their family doctor and record it with the optician's name. I frequently find that the doctor has sent them to some specialist, and they have wandered off to the optician. Recently an optician referred a patient to me who also needed medical treatment. I called up her family doctor and explained the situation to him, when he frankly told me that he had sent the patient to another oculist but was glad that the optician was honest enough to refer her to me. He was pleased that I had the case and promised me his cooperation.

I feel that the general practitioner would greatly increase his knowledge, improve his prestige, and add to his income if he would spend three months each year working in the special clinics throughout

*Read before the Kensington branch of the Philadelphia County Medical Society, March 12, 1920.

the city. It would help him to diagnose properly many special cases; it would show him those he could treat successfully; it would give him a different viewpoint of dispensary work, and cause him to discriminate in the cases which he sends to the dispensary. Most clinical chiefs would welcome the coming of physicians to their clinics in this spirit and it would bring about better cooperation between medical men throughout the city. I have advised a number of men to do this and the few who took advantage of the plan tell me that the knowledge gained has been of great value to them.

Now a word or two about the special cases coming to the family doctor for treatment:

Catarrhal conjunctivitis.—There are two forms, acute and chronic. In acute conjunctivitis the symptoms are pronounced and the bulbar conjunctiva is involved, while in the chronic form, the inflammation is usually limited to the palpebral conjunctiva. The objective symptoms are swelling of the lids, abnormal secretion, mucoid or mucopurulent conjunctiva, with redness. The lids are glued together in the morning and the patient complains of burning and itching and a gritty feeling. There is no involvement of the cornea and the increased blood supply is confined to the first system of blood vessels—the posterior conjunctival. The congestion is greatest at the periphery and diminishes as it approaches the cornea, the vessels being easily emptied on pressure.

Just a word with reference to the blood vessels in the conjunctiva, a knowledge of which will enable the practitioner to distinguish at a glance between serious and benign inflammation involving the eyeball. There are three systems of blood vessels in the conjunctiva. The first, or posterior conjunctival system of blood vessels are always seen in health; they enter at the periphery and travel toward the corneoscleral margin; they are of a bright red velvety color and are easily compressible; they can be emptied by pressing the fingers over the closed lids; the congestion is more marked at the periphery and lessens as it approaches the cornea. Congestion of this system is indicative of a simple process and is usually accompanied by increased secretion. The anterior ciliaries, or second system of blood vessels, consist of the anterior ciliary perforating and non-perforating arteries and veins. They are not visible in health, except the perforating which in dark complexioned persons appear as small brown dots on the conjunctiva about five millimetres from the corneoscleral margin. When they are inflamed there is a brick red congestive band beginning about five millimetres from the corneoscleral margin which extends toward the periphery. The greatest congestion is near the cornea; they cannot be emptied on pressure. This is indicative of a severe inflammation of the eye such as iritis, cyclitis, or glaucoma. The third system is the anterior conjunctival, which are not seen in health and when inflamed extend into the cornea from the corneoscleral margin. They are not compressible and this is indicative of a severe process, such as keratitis phlyctenula.

In a case of conjunctivitis, if you wish to determine the cause accurately, make a smear on a microscopic slide and have it examined. The pneumococ-

cus is probably the germ most frequently found; streptococcus and diphtheria bacillus may be present. The Koch-Weeks bacillus is the cause of epidemic catarrhal conjunctivitis or pink eye.

Treatment.—Warm local applications of boric acid or normal saline are indicated. In the office the conjunctiva can be touched, with a solution of silver nitrate. If the case does not clear up promptly the patient should be sent to a specialist or eye dispensary for more exhaustive study.

Chronic catarrhal conjunctivitis.—There is little or no secretion. While it otherwise presents the picture of acute conjunctivitis, the lids may be much thickened. Sometimes it is confounded with trachoma but the presence of trachoma bodies, scars and atrophic areas makes the picture clear. Spring catarrh, or vernal conjunctivitis, is a condition which occurs in youth. Its appearance in the warm season, the elevations resembling cobble stone, and the film of bluish white secretion serve to differentiate it.

Gonorrhoeal ophthalmia.—Every general practitioner should be thoroughly conversant with the preventive and prophylactic measures used in ophthalmia neonatorum. Unless he sees the treatment carried out in a lying-in hospital or an eye dispensary, he is not competent to do anything except give first aid treatment. A year ago a baby was brought to my office after three weeks treatment for ophthalmia neonatorum by the family doctor, who then told the mother to wash the eyes with boric acid solution until the discharge stopped, as nothing further could be done and the baby would probably be blind. The Lord was with him, for the infection was of a mild type. Although there was a great swelling and profuse purulent secretion, the corneas were not involved. How they escaped I do not know. The child made a good recovery without loss of vision by strenuous and persistent treatment.

Hordeolum or sty.—Suppuration of the glands of Zeiss and Moll is called external hordeolum. They are single or multiple and are often recurrent. The treatment is quite simple. Hot applications in the form of a poultice or gauze pad dipped in hot water and the application of a salve composed of the yellow oxide of mercury gr. 1—petrolatum album drams 11, usually hastens the process and brings it to a head. The pus may be evacuated with a sharp scalpel, after which the salve is continued and the hot compresses omitted, until recovery takes place.

It is well to remember that hordeoli are frequently produced by eyestrain, even though the vision appears to be normal. Every physician should have in his office eye test cards, both for distance and for near vision, but must understand that the ability to read the finest print is no indication that there is no eye trouble. There may be low refractive errors which frequently produce a great variety of reflex nervous symptoms. Prescribing glasses may put an end to the trouble.

Chalazion—internal sty.—It is evident that there is a close relationship between a hordeolum and a chalazion as a chalazion is simply a blocked up meibomian gland, causing a tumor of the eyelid. The sac is filled with gelatinous or cheesy material. Occasionally it may go on to suppuration, usually point-

ing inward, and rupturing forms a granulating area on the under surface of the lids. Occasionally the orifice of the gland may open and the contents gradually be expelled; then in a few months it fills up again. There is no treatment of permanent value but excision. If this is not carefully done and the sac entirely removed, the trouble recurs. Salves, hot applications, and massage are of very little service. This condition, like hordeolum, is frequently caused by eyestrain.

Foreign bodies on the cornea.—These are of considerable importance and the practitioner will do well, in these times of workmen's compensation, to handle them with kid gloves. It is of the utmost importance that a correct history of the character of the injury be obtained and the size and location of the foreign body noted. The best way to record the location of a foreign body is to consider the cornea in the aspect of a clock face. The upper part is at twelve o'clock, the lower at six o'clock, and the intervening points approximate to the numbers on the dial. The distance of the foreign body from the centre of the cornea or from the corneoscleral margin is then noted. You record a foreign body on the cornea, for example, at six o'clock three millimetres in from the corneoscleral margin or the limbus, and you have its exact location for future reference. The size of the foreign body is also noted in millimetres. Many very small sharp foreign bodies may, because of the speed which they attain in flying through the air, upon striking the eyeball penetrate and hardly leave a mark at the point of entrance.

A case in point may be cited. A man was struck in the eye by a foreign body, but as far as could be seen there was no evidence of injury. He suffered pain and on very close examination, with oblique illumination, a faint gray pin point area was noticed on the cornea near the limbus at three o'clock. When a magnet was applied to this area the iris pulled toward it, showing that the foreign body was imbedded in the iris. Under cocaine anesthesia, a small incision was made at the point of entrance, the tip of the magnet applied, and a piece of steel less in size than a pin head was removed without any very great injury to the iris. The x ray did not show this minute piece of steel. More skill is required to remove foreign bodies from the cornea than in doing more serious operations.

In the past we saw many bad scars following corneal ulcerations and even lost eyes, because some workman was supposed to be specially clever in removing foreign bodies from the eye. All cases occurring in the shop were sent to him. Even now, under present conditions, I find that many company physicians, nurses, and many general practitioners are hardly more skillful. I presume they do not understand the technic, have not the proper instruments, and do not appreciate the danger of careless handling.

I usually instil four per cent. cocaine in the eye, put in a clean eye speculum, seat the patient with a bright light over his head, put on a head mirror, and throw a beam of light on the cornea. With a magnifying lens in one hand and a sterile eye spud in the other, the foreign body is gently removed.

Occasionally a few drops of sterile boric or saline solution are dropped into the eye and the area is wiped with a cotton tipped probe dipped in boric or saline solution. It is better not to attempt to remove all the rust stain from the bed on which the foreign body has rested. Nature will take care of this.

Prescribe a boric wash, and if the injury is extensive instil one drop of one per cent. atropine solution. Be sure to apply a sterile bandage; if you do not the eye may become infected and you are liable to suit. Instruct the patient to return the next day for observation; in this way the best results may be obtained.

Corneal ulcers, phlyctenular disease and keratitis.—These fall in the realm of the specialist. The general practitioner will get best results by not handling these cases, but there is no reason why he should not have charge of them, see them occasionally and take charge of their general treatment and dietetic regulation.

Pterygium.—This occurs in teamsters, builders, farmers and other workers exposed to air and dust. It is frequently due to exposure and to foreign bodies, as dust or sand, getting into the eye. I have never seen any good results from local treatment, although I know there are some men who are enthusiastic about the application of alcohol. Operation is the procedure of choice.

Every practitioner should at least know how to diagnose iritis and glaucoma and also how to prescribe the initial treatment, especially where the patient cannot get to a specialist promptly. I will give you the differential diagnosis between iritis and glaucoma and say a word about the immediate treatment, because in these conditions, unless we are alert, irreparable damage may be done.

DIFFERENTIAL DIAGNOSIS.

Acute Iritis.

Intense bright redness of bulbar conjunctiva, intense pericorneal infection.

Cornea clear, very sensitive. Anterior chamber normal or deep.

Pupil contracted immobile, synechia often present.

Iris discolored, markings obliterated.

No contraction of fields.

No cupping of disc. Usually no increase of tension.

Intense pain radiating to side of face.

Acute Glaucoma.

Rather dusky bluish redness of bulbar conjunctiva; rapidly failing vision.

Cornea steamy, anesthetic.

Anterior chamber very shallow.

Pupil dilated, immobile, greenish in appearance.

Iris markings present not discolored.

Contraction of fields. Rainbows seen around lights and flashes of light; disc cupped.

Tension greatly increased.

Sick stomach and vomiting often occur; violent pain coming on frequently at night.

IMMEDIATE TREATMENT.

Iritis.

Instil one or two drops of one per cent. solution of atropine three times a day or more often as occasion requires to dilate the pupil.

Hot compresses, leeching.

No operation.

In iritis unless immediate and strenuous treatment is begun early the eye is badly damaged, but in glaucoma, unless remedial measures are instituted at once to combat it, the eye is lost. Therefore, it behooves the general practitioner to familiarize himself with these two important conditions.

Patients with glaucoma will often prevent a good result by refusing operation and sometimes the ophthalmologist will assist in this, as in a case which I shall cite. A woman called in her family doctor for violent pain and a red eye. Thinking it was iritis he instilled atropine. The next morning the eye was worse, so he sent her to me. I immediately used eserine, hot compresses, leeching, and advised immediate iridectomy, which was refused. I took her to another ophthalmologist who advised the same operation, but it was refused, so I dropped the case. Then they went, as they said, to a good eye doctor who was going to cure her with medicine; later I learned that she went to a prominent oculist in Philadelphia who continued the eserine and saw her three times a week for three months at five dollars a visit. Result, a totally blind eye.

Here I wish to say a word about hot and cold compresses. Cold compresses are indicated for acute conditions and should be applied constantly and are of very little value after forty-eight hours. Hot compresses are of use in many cases from the beginning and can often follow cold compresses after forty-eight hours. They are usually applied from fifteen to thirty minutes every three hours or at longer intervals. It will pay every general practitioner to own an artificial leech, by which he can withdraw blood from any congested area. I am surprised to find that in many hospitals it is not available. Natural leeches are hard to get and are not nearly so satisfactory.

This paper would not be complete without calling your attention to a condition which means a great deal to the patient from a cosmetic and economic standpoint, namely, the recognition of the condition known as squint or strabismus and the proper method of handling it. Every physician should at least know that there is a fusion centre which enables us to fuse the images which fall on corresponding parts of the retinas, and the difference between a phoria, which is a tendency of the eyes to deviate from parallelism, and a tropia, which is an actual deviation or turning of the eyes from parallelism and

Glaucoma.

Instil one or two drops of solution eserine grain one-eighth to one-fourth to the dram three times a day, or more often as required to contract the pupil.

Hot compresses, leeching.

Operation in twenty-four hours unless tension decreases and symptoms subside.

is manifest to the most casual observer. To demonstrate a phoria have the patient look at an object in the distance with one eye while you cover the other eye with a card. Look behind the card and if the eye is not looking straight ahead, you have a phoria or latent squint. Remove the card and the eye will quickly return to its original position of parallelism. Many intractable eye conditions and reflex nervous symptoms are due to this anomaly.

MONOCULAR AND BINOCULAR VISION.

It has been said that one eye is a necessity, two eyes a luxury. Cross eyed persons can shoot accurately because they only use one eye in sighting; they can tell direction, but cannot measure distance so well. They cannot thread a needle or direct the hand to a small object accurately. Binocular vision measures distance and speed more accurately than monocular vision. The development of binocular vision is one of the most important epochs in a child's life. We watch their dentition. We look after their tonsils and adenoids and yet when a child is brought to us with a squinting eye, we physicians pass it up and tell the parents the child will grow out of it. Why? Because we often forget or do not know about fusion sense or fail to recognize the importance of binocular vision.

Every physician knows the approximate date of the coming of the first tooth and when a baby should walk and talk, but he fails to study the sight of the child. Every babe at birth has only light perception. In a few weeks it can recognize large objects; later small objects, and during this time one eye may wander out or in while the other eye is straight. This is not harmful in the first six months. When a child directs both eyes to the same object, it is beginning to acquire binocular vision. This it does in the second half of the first year. Five years or more are necessary to complete the establishment of binocular vision which lasts through life.

Remember, binocular vision begins in the first year and is completely established by the sixth or seventh year and cannot be acquired after the seventh year. If the squint develops during this time or double vision occurs, the child learns to suppress one image and becomes amblyopic or blind in the squinting eye. Therefore these cases should all be sent to the oculist for study, treatment or operation and many eyes will in this way be saved.

A knowledge of this special work and the ability at least to give intelligent advice in these eye cases will be of great service to the general practitioner, especially in these times of advanced knowledge and I think the patients have the right to demand it. I am sure it will not harm but will assist the specialist in getting better results as the proper treatment will have been started and no valuable time will be lost.

SOLUTIONS.

Atropine is used in eye work, mostly in solutions of four grains to the ounce; eserine solution, one grain or less to the ounce; argyrol, ten per cent. to twenty-five per cent.; nitrate of silver, one to four grains to ounce, and in some special cases as high as twenty grains to the ounce; cocaine, twenty grains to the ounce. Cocaine should not be used much in

ulceration of cornea, as it will dissolve the cement substance in the corneal tissue and cause maceration. Holocaine in about the same strength can be used instead of cocaine. Zinc sulphate, as an astringent, one grain to the ounce; saline (normal) salt solution and a saturated solution of boric acid are the usual collyria in simple forms of congestion. For quick results adrenaline 1 in 1,000 may be added, five minims to the ounce. Every man doing compensation work should have an ounce of fluorescein solution on hand to stain the cornea to determine breaks in its continuity. The following is the formula: Fluorescein eight grains; sodium bicarbonate, eight grains; distilled water, one ounce. One drop is placed on the cornea and it is immediately washed off with boric acid or saline solution. It will leave a greenish stain on the broken corneal surface, but will not stain healthy tissue.

2028 CHESTNUT STREET.

REPORT OF FIVE OPERATIVE EYE CASES.

By EDWIN B. MILLER, M. D.
Philadelphia,

Associate in Ophthalmology, Temple University; Assistant Professor of Ophthalmology; Graduate School, University of Pennsylvania; Ophthalmologist to Roosevelt Hospital, Philadelphia.

In looking over the journals from time to time, we find reports of many rare and interesting cases and interesting accounts of new operations. I am going to depart from this and report a few cases from the ordinary group in which there appeared interesting features requiring somewhat different technique in handling. The first three cases were due to known injuries, the fourth probably to unknown injury and the fifth due to a disturbance in metabolism which produces cataract—in this case probably glycosuria.

CASE I.—March 26, 1917. J. F. was admitted to the Roosevelt Hospital with the following history: While at work in a bottling establishment was struck in the right eye by a flying piece of glass from an exploding soda water bottle. Thirty minutes after the accident, his eye presented the following appearance: There was an irregular linear incised wound of the cornea extending from just below the limbus at 7 o'clock to the centre of the cornea and then up and out to the limbus at 11 o'clock; the anterior chamber was empty and the iris was prolapsed into the wound at the upper and lower margins.

Under cocaine anesthesia after cleansing the conjunctival sac, I cut off the iris at both places and replaced the cut edges, instilled atropine, applied ice compresses and kept the patient in bed for a week, when he left the hospital in good shape and one month later refraction showed the following result: Right eye $+2.50+2.00$ ax $75=20/70$; left eye $+.50$ ax $90=20/20$. He had vision in all directions, except up and out where there was quite an extensive leucoma. The interesting points in this case are the escape of the other structures of the eye from injury and the rapidity with which recovery took place. In all cases of this character, I now perform conjunctivokeratoplasty.

CASE II.—February 17, 1919. I. K., colored,

aged thirty-four, sustained an accident similar to that in the first case. While working in a bottling establishment he was struck in the right eye with a piece of flying glass from an exploding soda water bottle. An hour later I saw him at the Roosevelt Hospital and found the following condition: A wound of the cornea semilunar in shape extending from the limbus at 11 o'clock to just above the centre of the cornea, then up to the limbus at 2 o'clock. The anterior chamber was empty and the iris was prolapsed at 11 o'clock. Atropine was instilled and ice compresses were applied. Under cocaine anesthesia, I cut off the prolapsed iris, replaced the pillars, smoothed down the wound with a spatula and covered the entire area by a conjunctival flap. Five days later when the stitches had sloughed out and the conjunctiva had retracted, I noticed that the lens had become entirely opaque. There was no infection and on April 2nd, when the eye was entirely quiet, I evacuated the lens material with a keratome. He made a good recovery. When the eye was entirely quiet, I performed a V shaped capsulotomy and secured a large black pupil; with the correcting lens his vision was $20/30$ for distance and $.75$ D type for near. The refractive error in the left eye was corrected giving him $20/20$ distance and 37 D type for near. A plain glass was placed over the right eye.

The interesting point in this case was that the injury while very much less than in the preceding case, produced a rapidly forming traumatic cataract, there being probably a slight break in the anterior lens capsule.

CASE III.—J. B., aged sixty-five, March 7, 1919, was removing a tire when the wrench slipped, striking him in the left eye. I saw him at the Roosevelt Hospital several hours after the accident and the eye presented the following appearance: There was a slight abrasion on the forehead above the left eye, also a small cut below the lower lid; the cornea was uninjured, the anterior chamber was deep, the iris was badly torn at 6 o'clock and there was partial dislocation of the lens down and in; a small amount of blood was visible in the anterior chamber. Vision was $3/200$. His right eye had been injured in childhood; the pupil was irregular and about three millimetres in diameter. There were some remains of the lens capsule around the pupillary margins, the lens having been absorbed; the central area was clear. Vision was $1/200$.

This man was kept in bed for a week, atropine was instilled and ice compresses were applied. All the inflammatory symptoms promptly cleared up and on the fifteenth day the eye was quiet. On March 31st I removed the lens with some loss of vitreous. A few days later, there developed a slight infection at the lower outer corner of the wound. Under treatment this rapidly cleared up and some weeks later refraction showed, right eye $+9.00+1.00$ ax $180=20/30$; left eye $+11.00+2.50$ ax $165=20/20$. Add $+2.50$ for near= 50 D type. Before the accident he only had protective vision in the right eye, never having obtained a suitable glass. Now he has two good eyes for distance and close work.

The interesting features in this case were the absence of injury to the cornea in view of the severe

injury behind it, and the rapid clearing up of the vitreous cloud which was present during the slight infection.

CASE IV.—An Italian woman referred to me by Dr. M. E. Smukler presented phthisis bulbi in the right eye following injury in childhood and a mature cataractous lens in the left eye, which was partially dislocated into the anterior chamber, being tilted backward above. The patient had light perception and projection down, up and in. Under narco and cocaine anesthesia I made the usual corneal incision with a conjunctival flap and immediately the woman turned her eye up. Because of her ignorance, even with the aid of an interpreter, we could not induce her to roll the eye down, and therefore it was impossible to do an iridectomy. As the pupil was well dilated and the lens was tilted backward above, I decided to deliver the lens in its capsule. Using two Smith lid elevators, Dr. Smukler holding the lids well up and open, by the use of hook and spatula the lens was tumbled without difficulty and came out under the upper lid, without loss of vitreous or prolapse of the iris. The toilet of the wound was then made and the eye closed. On examination of the lens, we found it was a distinctly black cataract, Morgagnian in character with the capsule loosely attached, so that one could lift the capsule up from the lens with a forceps. The patient made an uneventful recovery and left the hospital in eight days. Unfortunately there was an old retinal detachment including a good part of the nasal side, thus explaining the absence of temporal light projection and changing what would have been a perfect result into a case of only useful protective vision. The interesting point in this case is the good clean simple extraction obtained in an illiterate unruly patient while working under difficulties.

CASE V.—Wm. A., aged seventy-nine, had mature lenticular cataract in both eyes, light perception and projection being good. The patient had an old chronic diabetes. Operation was refused by another oculist, because of his age and the amount of sugar present, but as he wanted to see and was willing to take a chance, I agreed to operate without promising him any result and told him of the danger. I thought it wise to do a preliminary iridectomy in his left eye to thoroughly test the advisability of an extraction. Under narco and cocaine anesthesia a small iridectomy was performed. This operation was a perfect success; there was prompt healing and hardly any reaction. Thus encouraged I attempted to extract the lens. Before my corneal incision was finished the zonule ruptured below and some fluid vitreous began to come out. When I attempted to rupture the capsule, the lens moved with the cystatome in all directions. I eventually got a fair opening but the lens was soft and sticky and when about half of the lens substance was expressed so much vitreous was lost that I decided to stop. Replacing the remaining capsule and lens and replacing the iris pillars I closed the wound. I should have covered the entire incision with a conjunctival flap.

The next day I took a look at the eye and it seemed all right although the entire pupillary area was filled with lens substance and capsule. When I paid my second visit I found that the wound had burst open

and the remaining lens and capsule was in the open wound. There also was leaking of the aqueous at the outer corner but after looking at it from every angle, I decided to leave it alone and take a chance. This I explained to the family. I watched it for fifteen days. No infection occurred. On the fifteenth day the anterior chamber closed, the lens absorbed rapidly down and out and there was a clear area 3x5 mm. through which I could see the faint disc outline. He has good protective vision; I held a +12.00 condensing lens before his eye and found he could read 1.50 D type. I intend to do a capsulotomy and hope to get a good result. The interesting features in this case are first, the corneal flap was sufficiently nourished even though two-thirds of it was cut off from its blood supply for at least ten days; second, there was no infection in spite of the fact that the anterior chamber remained unclosed above and no increase in tension occurred after the wound closed, even though there was considerable debris in the upper angle; third, the remarkable manner in which the wound healed in an old diabetic is worthy of note; fourth, of great interest is the useful vision obtained in spite of the loss of a large amount of vitreous.

There are numerous questions that arise as we survey a series of cases like this, but time will not permit of their full discussion. Reports of difficult cataract cases and how the operator meets the difficulties would be both interesting and instructive.

2028 CHESTNUT STREET.

EYE CONDITIONS OF INTEREST TO THE GENERAL PRACTITIONER.*

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The general practitioner is frequently called upon to diagnose and treat ailments of the visual organ that are either emergency cases or diseases of such minor importance as to make the services of the eye specialist unnecessary. It is apparent, therefore, that in order to institute proper treatment and achieve results he must have a thorough knowledge of the eye conditions most likely to come under his care and at least a general familiarity with the more serious ocular affections that he may encounter in the course of his practice. This paper aims to give to the busy physician, in succinct form, the information he may require in his work, and aid him in treating intelligently conditions that too often are neglected because of insufficient knowledge of the subject, particularly that pertaining to the differential diagnosis of the commoner eye affections.

CONJUNCTIVITIS.

Perhaps the most frequent condition encountered in general practice is conjunctivitis. The physician will be called upon to differentiate between a simple inflammation of the conjunctiva and a disease of the deeper structures of the eye, such as, for ex-

*Read before the Kensington Branch of the Philadelphia County Medical Society, November 7, 1919.

ample, iritis and glaucoma. In order to make a careful distinction between these conditions the practitioner should recall something of the structure of the visual organ. The conjunctiva or delicate membrane that lines the eyelids (palpebral conjunctiva) and covers the front of the globe (ocular conjunctiva) receives its blood supply from two sources—the posterior conjunctival and the anterior ciliary vessels. In marked inflammations of the anterior section of the eye both the ciliary and the conjunctival vessels are injected. As a rule, however, the differentiation between the two forms of injection is readily made. When the conjunctival vessels are injected there is clearly visible a superficially disposed vascular network that can be moved easily along with the conjunctiva. The diseased structures take on a vivid scarlet or brick red color. In ciliary injection the individual vessels cannot be clearly made out, and when the conjunctiva is displaced, the vessels do not move along with the membrane. The latter is an important point in differentiating an inflammation of the conjunctiva from diseases of the deeper structures of the eye, as for example, iritis and glaucoma. The redness is prone to be more diffuse than in conjunctival inflammations, and there is a rose red or pale violet zone about the cornea—circumcorneal injection.

In differentiating these diseases one from the other we have as valuable diagnostic aids the discoloration of the iris, the presence of which should be ascertained by careful comparison with the normal eye. In conjunctivitis the iris remains unaffected, whereas in iritis and in glaucoma the iris is discolored. The diagnosis is influenced also by the size of the pupil, which is contracted in iritis, dilated in glaucoma, and unaffected in conjunctivitis. In conjunctivitis there are pain and tenderness, but the pain is not neuralgic, as in iritis and glaucoma.

An inflammatory glaucoma is often mistaken for an iritis by the presence of ciliary injection and discoloration of the iris, symptoms common to both diseases, a mistake which is rendered doubly grave by the fact that although we use atropine freely in the treatment of iritis, we know that it must never be instilled in a glaucomatous eye. In glaucoma the injection is decidedly venous in character or dusky red in color; the episcleral veins are large and tortuous, owing to the pressure on the vasa vorticosa throwing greater work on the anterior ciliary veins. In iritis the injection is general and intense, especially circumcorneal injection of the ciliary vessels. In conjunctivitis the injection is velvety and increases away from the cornea and toward the fornix. In acute glaucoma a characteristic symptom is the loss of vision, frequently coming on suddenly and being out of all proportion to the apparent inflammatory condition; in iritis the loss of vision greatly depends on the cloudiness of the aqueous or the exudation in the pupillary space. In simple conjunctivitis the vision is unimpaired, depending on the photophobia or the amount of mucus or pus which may float over the cornea.

Diseases of the conjunctiva form, on an average, thirty per cent. of all eye affections; in epidemics, of course, this percentage is much higher. For gen-

eral clinical purposes conjunctivitis may be divided into three forms, the hyperemic (and congestive), the catarrhal, and the purulent. There are, however, many subdivisions, such as croupous, diphtheritic, traumatic, trachomatous and scrofulous, but in these forms the conjunctivitis is merely a symptom of a special exciting cause. In the majority of cases of acute conjunctivitis the morbid matter is brought into contact with the conjunctiva through the medium of the atmosphere; this has been proved in a form of conjunctivitis by the discovery of a special bacillus by Koch-Weeks, Morax-Axenfeld, Hansell, and others. But there are also instances in which a poisonous element, circulating in the blood, has been the cause of the conjunctivitis. In measles, before the rash appears upon the body, there is frequently observed a conjunctivitis, this constituting, therefore, a prominent symptom of a beginning rubeola.

The prognosis of acute catarrhal conjunctivitis is favorable in uncomplicated cases, the disease disappearing spontaneously in from eight to fourteen days. The complications that arise in conjunctival catarrh consist for the most part of corneal ulcers. The onset of these complications is manifested by an increase in the pain and heightened photophobia. These complications are often the result of attempts at treatment of the catarrh by the laity, who do not hesitate to apply bread and milk poultices, tea leaves, raw meat, urine, or even a bit of placenta. The transmission of the secretion from one individual to another plays an important part in spreading the disease; for this reason the indiscriminate use of towels, handkerchiefs, and the like should be carefully guarded against. Search should always be made for foreign bodies, for atoms of dirt or dust may have become lodged in the cornea or in the conjunctiva of the upper lid. Indeed, a conjunctivitis is frequently brought on by a foreign body creating a condition that may give entrance to an infective germ; a type of this form frequently seen is the so-called pink eye.

The treatment of acute conjunctival catarrh is very simple: Frequent flushings of the conjunctival sac with a saturated solution of boric acid, with a little cocaine or sulphate of zinc combined, anointing the edges of the lids with borated petrolatum to prevent agglutination, and the instillation of a few drops of a solution of one of the silver salts, such as a twenty per cent. solution of argyrol, repeated at intervals. Applications of a solution of nitrate of silver, about one grain to the ounce, to the upper and lower lids once daily should also be used if necessary. The patient should be instructed to avoid dust, smoke, and vitiated air in general, and pass as much of his time as possible in the open air. At the onset a purge should always be administered. Stimulants, as a rule, should be avoided. The nasopharynx should be carefully looked after, and refractive errors corrected. The use of atropine cannot be too strongly condemned. In a simple conjunctivitis the drug is useless, and in some cases may, indeed, do much harm.—It should never be used unless there are decided indications for its employment.

OPHTHALMIA NEONATORUM.

All authorities are now agreed that ophthalmia neonatorum is due to but one cause, and that is infection. Statistics also show that the disease is an easily preventable one, and one that is readily cured if recognized in time. It is with the general practitioner that the early diagnosis of this disease rests, for it is on prompt treatment in the early stages that the preservation of sight depends. The disease is readily recognized, for all physicians are familiar with the congested eyes, the swollen conjunctivæ, the overlapping lids, from which thick pus exudes, and the dim and embedded cornea.

For the prevention of this disease the Credé method should be universally adopted. In fact a national law, instead of depending on certain States for the adoption of such a law, should be passed compelling every physician, midwife, and nurse to use a drop of one or two per cent. solution of silver nitrate in the infant's eyes as soon as possible after birth. In fact I am convinced that the invariable employment of the Credé method would almost entirely eliminate ophthalmia neonatorum and its dreadful consequences. It is reasonably certain that at the present time there is no remedy that can take the place of nitrate of silver, either in the prevention of this disease or its treatment.

In a recent communication to the different health boards of the large cities of the United States, it was astonishing to find the wide diversity of opinion and legislation in the different cities regarding the prevention of blindness in the newborn; but in the cities where the free distribution of nitrate of silver was made to the midwives and nurses, cases of ophthalmia neonatorum had been reduced considerably. The superintendent of the Philadelphia Lying-in Hospital says that in her eight years' experience in that institution she has never seen a patient who was harmed or injured by the instillation of silver nitrate, and this experience has been repeated again and again in many lying-in institutions. It has been stated that one fifth of all the blind asylums in the United States could be eliminated if the Credé method were universally adopted by obstetricians, nurses and midwives.

ETIOLOGY.

It is now generally conceded that ophthalmia of the newborn is acquired in the great majority of cases by the infection of the eyes of the infant with the vaginal secretions of the mother during the passage of the child along the birth canal. A few cases of antepartum infection have been found, and infants have been born with bennorrhæa fully developed, or the cornea already destroyed, but these cases are extremely rare, only 105 I believe, having been reported up to the present time.

In a large majority of cases the gonococcus has been found present in the pus from the affected eyes. Streptococci, staphylococci, pneumococci, and other pathogenic organisms have been detected microscopically, but when these have been the cause of the infection, the malady with proper treatment has usually run a mild course and gone on to ultimate recovery. When, however, infection by the gonococcus takes place, the course of the disease is usu-

ally a virulent one and may progress until sight is destroyed.

Sidney Stephenson, in his valuable essay on ophthalmia neonatorum, sums up the four main factors in the etiology of the disease. He says: 1. That a majority of mothers of ophthalmic babies are affected with vaginal discharge at the time of delivery. 2. That in most of these cases gonococci could be found not only in the pus from the maternal passages, but also in pus from the inflamed eyes. 3. That microorganisms other than the gonococcus could occasionally be demonstrated in the nongonococcal forms of ophthalmia. 4. That the serious cases of ophthalmia, that is, such as were likely to impair the sight, were almost invariably due to the specific microbe of Neisser. Neisser found the gonococcus present in 68.47 per cent. of ninety-two cases of ophthalmia, and in a total of 1,658 cases reported by forty-one observers gonococci were demonstrated in 67.14 per cent.

It has been shown and confirmed by numerous investigators that most pregnant women suffer from catarrh of the vagina, with a mucous or purulent discharge, and hence are in a condition to infect the eyes of their babies. While this is so, it must be remembered that gonorrhæa is often a latent disease, and that acute symptoms may be absent or remain quiescent. It is well known that pregnancy, labor, and the puerperal state are likely to cause a recrudescence of an old Neisserian infection, and the chronicity of this disease has been demonstrated by the fact that the gonococci have shown renewed activity after lying dormant in the genital tract for years. All this goes to show that the genital discharges of seemingly healthy women may convey infection to the eyes of the newborn, and thus the innocent offspring be deprived of their most valuable faculty.

The indications in the treatment consist of: 1, the employment of agents known to have a destructive effect on the gonococci; 2, the use of antiseptic or cleansing washes to keep the eyes free from infective matter. For the former indications the eyes should be carefully washed with a boric acid solution and a two per cent. silver nitrate solution applied to the surface of the everted lids by means of a cotton probe. Both lids should be carefully gone over quickly and thoroughly, paying particular attention to the little folds in the conjunctiva. The eyes should be subsequently washed at frequent intervals with a boric acid solution.

Let me emphasize that the treatment, to be effective, must be prompt. The second application of the silver solution should follow in from eight to twelve hours after the first. Too much stress cannot be laid on the necessity for keeping the eyes free from pus accumulations. This can only be accomplished by repeated washings, at fifteen minute intervals if necessary, both night and day, using a boric acid solution, as previously directed, or potassium permanganate or solution of bichloride of mercury, although mercury solution may prove irritating. In order to secure the most complete attention, it is generally necessary to use two nurses, one for night duty and the other for day. Too much stress cannot be laid on the necessity for

observing the strictest asepsis regarding everything coming in contact with the child. The newer silver salts, argyrol and protargol, in my opinion, possess certain advantages and should be used in conjunction with nitrate of silver but under no circumstances should the nitrate of silver be omitted.

KERATITIS ECZEMATOSA, PHLYCTENULAR KERATITIS,
OR PHLYCTENULAR CONJUNCTIVITIS.

This condition is characterized by the formation of single or numerous vesicles (phlyctenules) on some portion of the cornea or conjunctiva, and is accompanied by photophobia and blepharospasm. It is seen in scrofulous subjects—most frequently in children before the age of puberty, and less often in adults. It occurs in connection with inflammatory diseases of the nasal passages and adenoid vegetations. "The affection often follows measles or other acute exanthemata."

The phlyctenules appear upon the cornea, usually at or near the corneoscleral junction. At first gray, they rapidly break down, forming the phlyctenular ulcer, with vessels running to it. Their appearance is accompanied by an exacerbation of all symptoms. When the ulcer heals, the blood vessels disappear, but a strip of opacity remains. A microscopic examination of the epithelium of the affected areas reveals the presence of microorganisms—*Staphylococcus pyogenes aureus* and *albus*.

The treatment of simple phlyctenular keratitis consists of instilling atropine in sufficient strength to maintain dilatation of the pupil, thus putting the eye at perfect rest, and allaying inflammation. Hot stupes are useful in relieving pain and in promoting healing. Good hygiene should be maintained and sanitary surroundings looked into. Local cleanliness should be assured by the free use of boric acid solution. Diet and outdoor exercise are important factors. Of drugs, yellow mercuric oxide ointment may be used, and when the inflammatory conditions are subsiding, dusting the eye with calomel is a useful procedure. Codliver oil, iron, quinine, minute doses of calomel, and arsenic should be prescribed to meet the individual constitutional requirements. Refractive errors should be corrected

IRITIS.

In inflammations of the iris the symptoms depend largely upon the degree of hyperemia and the character and location of the exudate. Hyperemia of the iris is not, properly speaking, a disease, but merely a symptom, and it is only when the hyperemia becomes so extreme that an exudate is formed that a true inflammation—an iritis—can be said to exist. In iritis the acuity of vision is diminished in proportion to the amount of effusion and accompanying cloudiness of the aqueous or the exudate in the pupillary space. If the pupil is occluded, the eye is, for the time being, almost totally blind.

Among other symptoms must be mentioned, first, the pain. This is, as a rule, very characteristic. It begins as a dull, deep seated pain, as if the eyeball were being pressed upon. This increases in severity as the inflammation progresses, and is accompanied by sharp twinges, usually along the course of the fifth nerve. Thus it is that supraorbital neuralgia is a conspicuous symptom. Paroxysms of intense pain occur, gradually increasing in severity and

number as night approaches. This pain is different from that due to any inflammation external to the eye, and is throbbing and stabbing in character.

Another important symptom in iritis is the change in the color of the iris, in addition to the loss of its natural lustre. This is due to hyperemia, which causes a normally blue or gray iris to appear greenish—a change particularly marked when comparison is made with the unaffected eye.

Iritis may, in certain cases, resemble glaucoma, but the severity of the symptoms will easily differentiate it from simple conjunctivitis. The physician may, however, occasionally be misled by symptoms common to many inflammations of the deeper tissues, such as photophobia and injection of the conjunctiva. Yet of all inflammations of the eye iritis is that most readily recognized. The iris is at first discolored and contracted, and its power of movement impaired. The pupil loses its glossy blackness, there is a deep ciliary injection, and the cornea is dull. When the disease has progressed to the formation of an exudate and the iris has apparently become fixed, the nature of the disease can positively be diagnosed.

Rheumatic or gouty iritis occurs most commonly in middle life, and may be present along with other rheumatic affections. In rheumatic or gouty iritis the treatment should be directed toward relieving the pain and maintaining mydriasis. The customary treatment of rheumatism and gout should also be prescribed.

In my opinion gonorrhoea is a frequent cause of iritis and we can usually obtain a history of gonorrhoea when we fail absolutely to get one of lues. It is well, therefore, in suspected cases, in the males, at least, to examine the urethra and urine. Generally however, the history of gonorrhoea is not of recent date. In the majority of cases the suspicion that syphilis is the cause of iritis is well founded. In the secondary or tertiary stage of syphilis a form of iritis is occasionally seen, evidenced by the inflamed iris and the presence of yellowish or reddish brown nodules—gummata or condylomata—situated generally at the pupillary border. A Wassermann should always be made.

The treatment consists essentially of the free exhibition of mercury, perhaps salvarsan, local sedatives, and as in other forms of iritis, atropine freely. Dilatation of the pupil should be maintained until all irritation has subsided. Local measures to relieve the pain and congestion, such as Swedish leeches or the heurteloup to the temple, are useful, as are hot water fomentations applied at frequent intervals, and dionin also may be used.

GLAUCOMA

We shall now consider that most serious of eye diseases, glaucoma, a name applied to several varieties of a disease of which increased intraocular tension and dilated pupil are likely to be the most prominent symptoms. The tension of the eye may be estimated by palpating the eyeball through the closed lids with the index fingers, just as when testing for fluctuation in any other part of the body. It should be done with deliberation and care. A tonometer may be used.

In making a diagnosis of glaucoma the sound eye should always be used for purposes of comparison. Under normal conditions the intraocular pressure is quite constant, but in morbid conditions considerable variations occur. It should be remembered that the eyeballs of elderly persons are generally harder than those of the young. The early recognition of glaucoma by the general practitioner is of the greatest importance, for in this disease, more than in any other, prompt and proper treatment may save an eye that a mistaken diagnosis or improper treatment would invariably destroy. Inflammatory glaucoma is frequently mistaken for iritis, and as a consequence, is treated with atropine—which has a most disastrous effect upon a glaucomatous eye.

Glaucoma as an idiopathic disease usually attacks those of fifty or over, although younger persons are not immune. During the early stages the conjunctiva is seen to be hyperemic, the cornea slightly smoky and anesthetic, the aqueous cloudy, and the pupil moderately dilated. The association of inflammation and dilatation is seen in no other disease of the eye, while the peculiar sombre redness of the inflammation has its own significance. In glaucoma vision is usually much worse than in iritis—except in iritis with occluded pupil. The patient complains that he does not see well—as if a cloud of smoke were obscuring things. If there is a light in the room, it may be encircled by a halo of rainbow hues. If the physician examines the eye during the attack, he finds the cornea somewhat dull, anesthetic, and diffusely clouded, resembling ground glass. After such an attack which usually lasts several hours, the eye may assume an apparently normal condition. As the disease progresses these attacks become frequent, and the patient complains of pain in the head, ears, and even in the teeth. The pain is, in fact, intolerable. An examination at this time shows all the evidences of a violent inflammation—edema of the lids and of the conjunctiva, the latter being greatly congested. The injection, being preeminently of a venous character, is of a dusky red color. The cornea is dotted and presents an appearance of smoky cloudiness. It is almost or quite insensitive to the touch. These are the symptoms of an acute attack. In the third stage the eye is completely blind. Vomiting frequently occurs, a symptom that has often led to errors in diagnosis, the patient being treated for gastric disturbances, while the ocular symptoms were regarded as neuralgia or conjunctivitis.

Every case of glaucoma if allowed to go untreated will probably end in complete and incurable blindness, and the necessity for an early recognition is thus at once made apparent.

Treatment should be directed toward the reduction of tension. For the relief of pain and in the hope of curing the disease iridectomy or trephining is without an equal. Morphine hypodermically is invaluable, as likewise is eserine. The coal tar products are also useful. When all is said, however, early operation is the treatment. Mental depression must be overcome. Glaucoma cannot be cured, but in favorable cases acute attacks may be cut short by pilocarpine or eserine.

1305 LOCUST STREET.

THE HISTORY OF ACIDOSIS.*

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While the subject of acidosis as we now know it is of comparatively recent development, an investigation of the literature on the subject shows that it had its origin seventy years ago. The term acidosis was first used by Naunyn (1) in 1906, and was applied by him to an abnormal metabolic condition in which hydroxybutyric acid was formed. The broader use of the term has been the rule since the writings of Henderson in 1909, Sallards in 1914, Peabody in 1914, and Howland and Marriott in 1916.

The theory of acidosis had its inception in 1850 when a French investigator named Boussingault (2) made the discovery that large amounts of ammonia frequently appeared in the urine of advanced diabetic patients. Modern writers frequently ascribe this discovery to a German observer named Hallervorden (3), who in 1880 repeated and confirmed Boussingault's work, and so stated in his writings. The reason for this is evidently the highly unfavorable criticism of Boussingault's German contemporaries as to his methods and technic. However, Schaffer (4) has shown that Boussingault's technic was distinctly superior to that of all of his contemporaries. In the meantime A. Kussmaul (5) in 1874 made the first clinical observation in noting the dyspnea in advanced diabetic patients which he named air hunger. His description was classical, describing the expansion of the thorax in all directions, the following of complete inspiration by complete expiration, with absence of cyanosis, and of congestion of the veins of the neck.

In 1883 E. Stadelmann (6), in the search for acid radicals to account for the presence of ammonium salts in the urine, discovered betaoxybutyric acid. In this paper he set forth the acid intoxication theory and indicated the logical alkali therapy as it is used at the present day. In the same year Von Jaksch published a paper (7) describing the substance which gave Gerhardt's ferric chloride test in diabetic urine, and positively identified it as acetoacetic or diacetic acid. He included diacetic acid in his acetone theory of diabetic coma, having proved definitely while working in his father's laboratory that the volatile substance obtained from the distillation of fever and diabetic urine is acetone. Soon, however, acetone was proved to be negligible in its toxic effects, and Von Jaksch was unable to substantiate his contention that acetone was the mother substance of the other so-called acetone bodies.

On the other hand, Walter (8) in 1877 had demonstrated that mineral acids were capable of combining with basic groups in the blood, and that ingestion of these acids by animals proved fatal, although the blood serum remained faintly alkaline to litmus. Magnus-Levy (9) in 1899 showed that the chief alkali robber in dyspneic coma was beta-

*Read before the Brooklyn Pediatric Society, April 28, 1920.

oxybutyric acid. Knoop of Strassburg (10), in the opinion of Folin made in 1905 the most important advance since Stadelmann, namely, demonstrating that fatty acids are the main source of supply of the acetone bodies. Folin (11) states that these fatty acids which contain an even number and not less than four carbon atoms can be oxidized to oxybutyric acid.

Walter had found a uniformity of symptoms in the administration of hydrochloric acid to rabbits. If the quantity inserted into the rabbit's stomach exceeded .9 gram to the kilo of body weight, death came within a few hours. The phenomena were ushered in by increased frequency of respiration, each respiratory movement being more labored, deeper and accompanied by forcible heaving of the body walls. The animal lost the power of motion and lay in one position. Fifteen minutes after this stage was reached the dyspnea ceased, blood pressure fell, the heart action weakened and stopped, although respiration ended before the heart ceased to beat entirely.

Up to this period in the literature nothing had been done on the carbon dioxide tension either of the blood or of the alveolar air. Haldane and Priestley (12) in 1905 devised a method of getting alveolar air by means of a three quarter inch hose with a glass mouth piece. Lindhard (13) in 1911 reported a method of getting the alveolar air by a Krogh glass valve with a small flexible lead tube with an interior bore of one mm. which was passed as far as comfortable into the pharynx. Then Plesch (14) in 1909 suggested the rebreathing of a limited amount of air until it was in equilibrium with the air in the alveoli.

In 1914 Peabody and Boothby (15) working in the Peter Bent Brigham Hospital in Boston evolved an apparatus with a three way valve by which the patient breathed into a bag for a given length of time. They filled the bag with 1,000 c. c. of air so as to allow of a deep inspiration on the part of the patient. Their apparatus was a modification of one described by Porges (16) and they agree with him that the optimum time of breathing into the bag is twenty-five seconds, and the average carbon dioxide tension is about forty-five mm.

Howland and Marriott (17) warn us that acetonuria and acidosis are not synonymous terms. The acetonuria of starvation or increased food requirement rarely results in acidosis. Acidosis probably depends on the same underlying cause as most cases of cyclic vomiting. Marriott (18) in 1916 brought out a colorimeter of standard phosphate solution colored with phenolsulphonphthalein. This was primarily meant for use in children and the child was made to breathe into a bag twenty-eight to thirty-two seconds, avoiding collapse of the bag, and then the air was passed through a test solution colored in the same way as the standard tubes and then compared with them. The colorimeter tubes are arranged in series with a ground glass background and are calculated so as to give at once the carbon dioxide index in the same way as a hemoglobinometer. With this test set the normal carbon dioxide tension in the adult is shown to be forty to forty-five mm.; in children three to five mm.

lower. A tension of thirty to thirty-five shows a mild degree of acidosis, one of twenty imminent danger, while in coma with acidosis it may be as low as eight to ten mm.

The first adaptation of a clinical method of estimating the carbon dioxide given off from the blood plasma or the carbon dioxide tension of the blood was reported by Van Slyke in 1915 (19). He found that the results attained were the same as those with the alveolar air methods and this has been repeatedly verified since that time.

The prophylaxis of acidosis in intestinal conditions in children is advised by Schloss (20) using in severe cases the veins or longitudinal sinus with a four per cent. bicarbonate of soda solution, or a two per cent. solution subcutaneously. In March, 1920, in a lecture before the Harvey Society at the New York Academy of Medicine, Marriott expressed his belief in the causation of acidosis by the anhydremia produced by the loss of body fluids in diarrhea, and stated that he had found the most rapid and efficacious method of combating the acidosis in intraperitoneal injections of normal saline which promptly corrected the dehydration of the blood.

CYCLIC VOMITING.

While there is a definite and serious difference of opinion among pediatric observers as to the connection between cyclic or recurrent vomiting and acidosis, it must inevitably be considered in any history or investigation of acidosis.

It seems that the first important description of the disease was by Gruere (21) in France in 1838-1841. Marfan (22) in 1905 and other French writers have associated recurrent vomiting with acetonemia, and have even called it acetonemic vomiting, on the ground that acetone is so constantly present in the urine. There is no evidence, as Marfan admits, that acetonemia produces the attack, since acetonuria is seen in so many other affections. D. L. Edsall (23) in 1903 pointed out that the presence of betaoxybutyric acid indicated the possibility of the condition being an acidosis, and advised full doses of sodium bicarbonate even in the intervals. Griffith (26) thinks this has much in its favor, but is wanting in certain proofs, and the difference between acetonuria and acidosis is to be borne in mind, as was pointed out by Howland and Marriott (17) in 1916. Mellanby (24) in 1911 and Sedgwick (25) in 1912 found a urinary secretion of creatin at the time of the attack, and believed that this was due to abnormal metabolic changes. Sedgwick also thinks that adenoids are a powerful etiological factor. Richardière (27) in 1905 believed that the occasional coexistence of icterus was an evidence of the involvement of the liver in the disease process. Charles Hunter Dunn (28) is so convinced of the connection between this condition and acidosis, that he divides the latter subject into recurrent vomiting and acid intoxication.

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178 WOODRUFF AVENUE.

CHILD HEALTH WORK IN THE SOLVAY SCHOOLS.

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The objects sought in our health work in the Solvay schools are threefold: First, to lower mortality rate; second, to prevent sickness, and third, to encourage the best possible mental and physical development in each individual child. The work is divided into four general heads: 1, the prenatal clinic; 2, the infant welfare clinic; 3, the preschool clinic which fills the gap between the age of infancy and the school age, and 4, the school welfare work which takes the child from kindergarten through high school.

The conditions at Solvay have been unusually favorable for the success of this plan. Solvay is an incorporated village of 6,000 inhabitants. It has fifty-one per cent. of foreign population. The village is a suburb of the city of Syracuse. It has its own water supply and sewerage plant. Practically all of the streets are paved. The school system con-

sists of a high school, two graded schools and one rural school. There are 1,588 pupils. There are no hospitals but we have access to the wards of the Syracuse hospitals and to the free dispensary connected with Syracuse University.

The entire work is under the supervision of the school physician. The staff consists of the school physician, an ophthalmologist, a dentist, a dental assistant, two school nurses, one baby welfare nurse, a visiting housekeeper, a nutrition worker, and a physician who conducts the prenatal clinic. The prenatal clinic is held each week. We have at present ten women registered. This clinic is held by Dr. Clara Gregory assisted by our baby welfare nurse. A maternity history is taken and physical examination including pelvimetry is made. Urine and blood pressure examinations are made each month during the early part of pregnancy. This is done every two weeks during the later months of pregnancy. The doctor advises the expectant mother regarding her diet and mode of living. The teeth are filled and a mouth wash prescribed. The women are encouraged to go to the hospital for their confinement.

The infant welfare work is divided into two general headings, work in the clinics and field work. It is done in cooperation with the State Child Welfare Department. The clinics are held each Monday afternoon. At these clinics any mother in the town is allowed to bring her infant. From September 1, 1918, to September 1, 1919, we cared for 522 babies. The general form in each new case is filled out by the nurse and any additional facts suggested are added by the physician. The babies are weighed at each visit by the nurse and a weight record made. The chief purpose of this clinic is to teach mothers to feed their babies properly. Every attempt is made to induce mothers to nurse their infants. In spite of our efforts we find that thirty-one per cent. of the babies are bottle fed. This percentage should be much lower and we are making the greatest effort to bring it down. This high percentage is in part due to the mothers and in part due to the family physicians. Many mothers seem anxious to take their babies from their breast for insufficient reasons and doctors often advise this without careful investigation. Breast fed babies may have digestive disturbances when the breast milk is normal. These disorders are due to irregularities in the intervals of feeding, to the manner of living on the part of the mother and to insufficient length of single feedings. It should be the duty of the attending physician to insist that the mother nurse her baby at stated intervals and also that she nurse the baby for a definite number of minutes as the conditions warrant. Further than this the mother should be instructed in regard to the manner of her living and hygiene during this period.

The problems of infant feeding form a large proportion of the problems presented in infant welfare work. We insist that our babies shall be fed with certified milk. The bacterial counts of all milk used are obtained at least once a month. For a year we supplied a certified cow's milk at a reduced cost to mothers who were using bottle feed-

ings. The milk was distributed directly from the school at a cost of nine cents a quart. At that time grade A milk was selling for eleven cents a quart. We did this in order to demonstrate to them the superiority of certified milk for infant feeding. We feel that this demonstration was a success for since we have stopped distributing milk we have no trouble in inducing mothers to use the best grade of milk. I think that it is important for the physician in charge of an infant welfare station to keep himself informed regarding the bacterial counts of all milk used by the mothers. In private pediatric practice infant feeding presents a different problem than in a baby welfare clinic. A pediatricist has many difficult feeding cases to care for, while in the welfare clinics the large proportion of patients are normal babies and are not difficult to feed. We use dilutions of whole milk basing the amount on the caloric requirements. Cane sugar is used in most cases. I am convinced that it is not necessary to ask mothers to buy the more expensive sugars used in infant feedings. In our feeding both breast and bottle babies we insist that our infants be fed at a regular stated interval and I feel that we are successful in getting the mothers to do this.

After instructing the mothers regarding the new formula, the nurse is sent to the home to show the mother how the formula should be made up, the proper care of the milk and how to cleanse and care for nursing bottles and nipples. The home visits of the nurse are of vital importance in conducting a baby welfare clinic. Without this work the clinic could not succeed. Our nurse makes a visit each month to the town registrar for a list of the births and infant deaths during the preceding month. The nurse calls at the home to interest the mothers in the welfare clinic and asks them to bring the babies to the clinic for examination. The list of infant deaths is used by the physician in his attempt to lessen cases of preventable sickness. The nurse is instructed to advise that the family physician be summoned to care for any sick infant who, in her opinion, requires medical aid. This is of advantage since many cases are thus placed under a physician's care earlier than would otherwise be true. The nurse continually advises mothers in matters of cleanliness, diet, in the care of milk and in the care of nursing bottles and nipples.

Cases of respiratory diseases are often seen at the clinic and if these are of a benign nature remedies are prescribed. I feel that this is better than allowing the mother to use household or drug store remedies as these cases would rarely be taken to a physician for treatment. No attempt is made to treat the more serious diseases as bronchitis or pneumonia. The mothers are always instructed to discontinue all feedings and give the baby plain water or barley water. If the nurse considers the case of any possible serious nature the family physician is summoned at once. The early treatment of intestinal diseases especially in the summer months is of the first importance and we feel that by stopping the feedings and by placing the case early in the hands of a physician, the high mortality rate can be materially diminished.

Another idea that we have developed and which we feel is of distinct advantage is the manner in which our clinics are held. The patients are seen and examined by the doctor in the same room and in the midst of the mothers who are waiting and each point explained to the mother is also heard by those mothers waiting. All mothers, in this way, receive repeatedly the principles of infant care and hygiene. The annoyance caused by the infants and children in the room is offset when mothers see these principles successfully applied. I believe that this is the reason that we are able to have practically all of the babies fed at regular intervals.

The infant mortality in Solvay has steadily decreased since the clinic has been in operation. Last year we had enrolled in our clinic seventy per cent. of the infants in the village. This year that percentage has been increased. The mortality rate for 1916 was 156. For 1917 the mortality rate was ninety-seven. For 1918 it was eighty-three. The infant welfare clinic in its present form was organized in 1917. Before that time we were holding clinics but without a nurse who devoted all of her time to the work. I believe that in order for a baby welfare clinic to be successful it is necessary for the physician to be paid. One of the first requisites of a successful clinic is the regular and prompt attendance of the physician in charge. Since most physicians gain their livelihood through the recompense they receive from their private practice, it is necessary for them to respond to their calls and consequently they are often late to the clinics or are not able to attend. If they receive sufficient compensation for the work the clinic could demand their prompt attendance.

The preschool clinic cares for children between the ages of two and five years. From the viewpoint of preventive medicine this is an extremely important period. It is the period during which the child forms faulty food habits. Many children who have been properly fed during the first two years of life are allowed to select their own diet during this period. Many children begin at these ages to eat whatever diet their fancy dictates. Faulty food habits once formed are extremely difficult to change. This is also the age in which many children learn to drink coffee and to eat candy before meals. These habits sadly affect their nutrition and their resistance to infection. If the nutrition is decreased seven per cent. below the normal their rate of growth is retarded. The teeth during this period should receive attention. Carious teeth should be filled since the decay and early loss of the primary set affects the development and formation of the jaw.

This is also the period during which the adenoids should be removed. The changes in the face, the retarded development of the nose, the high arched palate, the flat chest and the middle ear complication produced by adenoid growths could largely be prevented if the adenoids could be removed before the age of five. All children attending school receive at least one physical examination a year. This includes an examination of the height, weight, nutrition, eyes, ears, nose, teeth, throat, glands, heart

and lungs. All children are examined with the chest exposed.

The routine examination is made in the following manner. The height and weight are taken. The mouth is inspected, examining the pharynx first, then the teeth. The hands are now passed along the sternomastoid muscle to determine the condition of these glands and along the back of the neck for the same purpose. The heart is then examined oscillating each of the four valvular areas. Examination of the lungs consists of at least six oscillations in front and the same number in the back. The forced cough at the end of expiration is used in making examinations. The chest is also examined for D'Espine's sign. By these methods efforts are being made to detect the early stages of tuberculosis. This examination is made in an average of three minutes. Without using the forced cough at the end of expiration and the D'Espine sign the examination can be made in an average of two minutes. If school children are to be examined at all and a careful examination can be made in this time I see no reason why it should not be done.

I believe that there is a close relationship between the work of the school physician and the prevention of tuberculosis among children. Until more exact methods of diagnosing early cases have been worked out, I feel that we can accomplish much in the way of prevention by applying our present knowledge. During my first year in Solvay I found children with pulmonary tuberculosis, who showed positive signs and tubercle bacilli were found in the sputum. The conditions in a school room with children closely associated for five hours each day are ideal for continuous infection. For these reasons I believe that it is not safe for children to attend public schools in which children are allowed who do not have their chests examined at least once a year. Further than this I believe that many cases of tuberculosis among children could be prevented were this universally done.

I have thought that we could go farther and find the earlier cases and with this idea in view we are making a list of the children who come in contact in their homes with known patients with tuberculosis. Patients who show suspicious physical signs are listed and reexamined and if these signs persist on the second and third examination we will attempt to have an x ray taken and an examination made by a specialist.

The nutrition of each child is measured by a scale (1) which I have prepared which divides nutrition into four classes: 1, overnutrition; 2, excellent nutrition; 3, passable nutrition; 4, malnutrition. The observations made each year are placed on a separate chart for each child and these observations connected by a line form a curve of the child's nutrition during school period. If a child is found to be malnourished he is placed in one of our malnutrition classes where an effort is made to correct his nutrition.

The principal causes of malnutrition may be classified as: Physical defects, 1, adenoids, 2, hypertrophied tonsils; 3, decayed teeth; 4, eyestrain; habits, 1, food habits, coffee, tea and alcohol and candy

between meals; 2, lack of rest; hygiene, 1, sleeping in congested, unventilated rooms; disease, 1, any actual diseased condition as tuberculosis or syphilis.

During the past year an attempt was made to correct our malnutrition cases after the plan of Dr. Emerson of Boston. A special nutrition worker was engaged who was trained by Dr. Emerson. This year we have divided the malnutrition cases into two sections. One section is cared for by this nutrition worker after the plan of Dr. Emerson, the other section is in charge of our dietitian who is a graduate of Mechanics Institute at Rochester. The majority of all malnutrition cases are either caused by infected tonsils and adenoids or by faulty diet and often a combination of the two.

The result of tonsillectomy on nutrition is shown by the following data. This gives a summary of the weights of ninety-five children who have had their tonsils removed for at least a year. These children have lived under the same conditions following tonsillectomy and have received the same diet. Six pounds was used as an average yearly gain for a basis of comparison. Sixty-eight patients or seventy-one per cent. gained more than six pounds. Three children failed to gain during the year and two cases lost weight. One of the two children that lost weight had active pulmonary tuberculosis.

We have made an investigation to determine the diet of 530 school children between the ages of five and twelve years. The diets were separated into three classes.

This data showed that nearly half of our children receive insufficient food and that over half of these children are in the habit of drinking coffee. You can see the importance of considering diet in relation to any nutrition problem.

No child is allowed in either class whose malnutrition is obviously due to any physical defect as adenoids, tonsils, etc. The Emerson system as practised by our nutrition worker mainly works through the child. The interest of the child is obtained in his own physical growth. He is asked to fill out a note book showing the amount and character of the food he eats. His diet is corrected and the approximate number of calories he consumes each day is placed on the chart each week. He is asked to take a daily extra lunch and if he does so a red star is placed on the chart each week. He is also requested to take a rest period each day. If this is done a blue star is added. A weight curve is kept showing the progress in weight. The chart also shows his normal weight curve. When he has reached the normal curve he is graduated. He is also asked to give up drinking coffee and requested to slip with the windows open nights. The classes of malnutrition are held once every week. In these classes the nutrition worker teaches the children what food is for, the kinds of food that are best suited for growth, the harm done by drinking coffee and tea and matters of hygiene. The case of each child is then considered separately. In the event the child has gained the reasons for this are brought forward and the child is encouraged. In case he has not gained the reason for this lack of gain is

sought and he is stimulated to greater efforts. The physician regularly visits the class and adds his influence toward gaining the cooperation of the child. Food models are used to aid in teaching the children a balanced diet and food values.

The dietitian conducts her work by using the class method of teaching the children diet and hygiene and by visiting the home and teaching mothers proper methods of cooking and preparing food, what foods to buy to keep within their income. She advises the parents to allow the children to drink no coffee and to sleep with windows open. She also uses extra rest periods for the badly nourished. The results of these two experiments will be of interest.

The following list gives the defects found from September 1, 1918, to June 30, 1919:

Defects		Treated
Vision	149	149
Hearing	14	11
Teeth	510	508
Nasal breath	160	92
Tonsils	273	138
Nutrition	215	130
Cardiac	16	16
Pulmonary	12	12
Nervous	13	13
Orthopedic	13	13
Skin disease	151	151

Through the operation of the Boyd School Dental Clinic, this condition has been practically eradicated. A summary of the work done in the dispensary from February 15, 1917, to April 8, 1919, is as follows:

Treatments	1,329
Extractions	1,895
Cement fillings	920
Amalgam fillings	2,890
Silicate cement F.	254
Cleanings	1,255
Extractions	1,017
Total	9,560

The value of this work estimated at the rates charged in dental offices is \$10,242. The fees paid by the patients were \$455.15. The actual cost of equipment and salaries was \$5,679. The value of the work to the community is apparent. The community, realizing the value of this work, has this year assumed the expense of the dental department.

We are now carrying on a plan of preventive dentistry. After a molar tooth has become decayed many treatments are needed before this tooth can be filled. If the dentist could fill this tooth when the carious process first begins, much time would be saved the dentist, and many extractions would be prevented. Under a plan of preventive dentistry a large proportion of the 1895 extractions which we were forced to do could be prevented and very little treatment work would be needed.

The success of preventive dentistry can be shown by the fact that from February, 1917, when the dental clinic began to August, 1918, including the first seventeen months of its operation, we treated on an average of eleven, six year molar teeth each month. From September, 1918, to June, 1919, a period of nine months, we treated on an average of four, six molar teeth each month. And from September, 1919, to December, 1919, the past four

months, we treated on an average of but 2.4 each month. The six year molar is the first permanent tooth and as you will remember we found twenty-five per cent. of the children with these teeth so nearly decayed that they required treatment before filling. If we could work only on our own children and those who enter school at kindergarten ages, we could entirely eliminate this tooth destruction, but we will always have some children with badly decayed molars who come to us from other schools.

We have been unusually successful in correcting errors of refraction. In 149 cases found the last school year we corrected one hundred per cent. Much credit is also due the nurses in the follow up work. They did not rest content until these children were provided with proper glasses. After glasses have been provided it is necessary to see that they are worn.

The enlarged tonsils and adenoids present a difficult problem to the school physician. We have been extremely cautious in selecting cases in which we advise operation. Our opinion has not always been substantiated by the family physician. Unfortunately there is some difference of opinion among the doctors in regard to what kind of tonsils should be operated. I feel that doctors should consider a case carefully before giving advice. From our 273 cases we were able to have 138 operated, which is fifty per cent.

In concluding I want to correct an impression that I have heard advanced many times regarding this work at Solvay. I hear that this manner of work is not practical since we have unlimited funds of money at our disposal. One would think that at Solvay resided a Midas with a golden touch. This is not true. We can spend money only when we can show that the expenditure will bring sufficient results to warrant it. Every dollar spent must show at least a dollar's worth of results. It is purely a business proposition and we are spending no more money than any community ought to spend in proportion to its population. If the conservation of children is of importance, money must be spent to put methods of conservation into successful operation. It cannot be done in any other way. Compare the expense of child education with the expense of child welfare work. We are spending but one dollar for health to every eighteen dollars spent for education. It is not sound business to spend large sums to educate a poorly nourished child with adenoids, enlarged tonsils, flat chest, retarded physically one or more years. Figure the loss of time and money in attempting to teach a child to read whose eyes will allow him to see the printed page but imperfectly. And shall we allow our educators to spend their time on a child with tuberculosis, not to mention the other children he will start along the same highway to chronic diseases?

None of this work described costs too much for any community if we expect to train a future generation of virile, healthy, energetic men and women.

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REPORT OF A CASE OF MELANOMA.*

*From Gouverneur Hospital, N. Y., Medical Service.*By S. R. MONTEITH, M. D.,
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There are three features of the case under consideration which lead us to report it: First, the volcanic rapidity of its clinical course; secondly, the distribution of the metastases as shown at autopsy, and the comparatively minute quantity of pigment seen in the tumor masses.

CASE.—Patient, M. K., an adult white female aged twenty-three years, admitted to the wards of Gouverneur Hospital, October 25, 1919, at 8:40 a. m. The patient while thin and undernourished did not evidence a marked degree of cachexia. She was markedly dyspneic, somewhat cyanotic and jaundiced. The jaundice, while marked, was of a lemon yellow tint but not bright yellow. On the right back, at the lower part of the neck, above the scapula, was a large firm reddish cauliflower mass, raised above the surface of the skin three-eighths of an inch and measuring one and a half inches transversely by an inch vertically. This mass was sloughing, and from it exuded a bloody discharge. Extending outward from this mass was a scar which reached the shoulder. In the line of this scar, and attached to the skin, were two firm hard masses. There were other masses palpable; these will be described later.

The following history was obtained: The family history was negative for chronic diseases. The previous history was negative for any disease except measles in childhood. In reference to the masses described, they were first noticed by the patient five years previously, but gave her no concern. She had been in good health until four weeks prior to admission to the hospital. At that time the hard masses on the right shoulder began to itch; later, they ached and pained her. About a week after the beginning of this trouble (three weeks before admission to the hospital) her doctor had incised the most painful of the masses. From this wound the cauliflower mass had grown. It was fiery red in color, bled easily, and appeared to be bubbling over on top of the skin. The next symptom noticed by the patient was a severe, nonproductive cough; next, pain in the right upper abdomen. Later there were chills and fever, the cough became productive of a thick tenacious sputum, and a few days before admission the patient began to suffer from attacks of severe dyspnea.

In addition to these masses, there were other nodules as follows: Over the right side of the back, just within the inner border of the scapula, was a firm mass in the subcutaneous tissue, not attached to the skin, about one half by one quarter inch in extent. Over the left side of the back, on a level of the ninth dorsal vertebra, was a firm swelling not attached to the skin, but which seemed to be attached to the ribs for about three quarters of an inch. Over the right side of the neck posteriorly, on a level with the sixth cervical vertebra, and adjacent to the cauliflow-

er mass, was a nodule one half inch long. This mass was present in the subcutaneous tissue, but not adherent to the skin. Below this area and somewhat to the right was another similar nodule but smaller in extent. Posteriorly, in line with the posterior cervical lymph nodes was felt a large, firm mass resembling in consistency a large lymph node. This also was not attached to the skin. Here also, there were a few very small lymph nodes. In the left supraclavicular region there was a large nodule. The axillary lymph nodes were not palpable. The inguinal lymph nodes were not palpable. It is well, in view of the fact that there was no postmortem examination of the cranium, to emphasize the fact that no neurological disturbance was noted; the eyes seemed normal in reaction and in movement. There was no history nor evidence of ocular disturbance.

The heart was normal in size and position, the action was rapid with a harsh systolic murmur heard at the apex and transmitted to the axilla.

In view of the postmortem findings I wish to call especial attention to the lung signs: Motion was impaired more on the left side than on the right. Percussion showed flatness below the clavicle on the right lung anteriorly; auscultation gave low pitched tubular breathing, amphoric in character, over the same area with no râles present. Posteriorly, percussion and auscultation were negative. Over the left lung anteriorly there was flatness to percussion, and on auscultation low pitched tubular breathing below the clavicle. On inspiration there were many loud leathery râles. Posteriorly, there was complete flatness to percussion over the upper half of the lung. Auscultation gave, over the same area, marked tubular breathing, bronchophony, and coarse râles on inspiration and expiration. The left lung, clinically, was more markedly involved than the right lung.

In the abdomen the liver was palpable an inch below the costal margin. In the gallbladder area there was a round, hard mass, palpable over the liver just below the costal margin. This mass was the size of an egg and moved with expiration and inspiration. The uterus was palpable; the fundus being felt just below the umbilicus. Vaginal examination showed that the cervix was soft, the external os admitted one finger, the internal os being closed. There was no uterine bleeding.

Other features of the physical examination, including the reflexes, were negative.

THE CLINICAL COURSE.

On admission the patient had a temperature of 99° F., pulse 140, respiration 44. The cyanosis and dyspnea continued, and became progressively more marked. There were frequent stools, those of the first day being brown in color. On the following day the stools were clay colored and sticky. A small amount of urine was passed, not over 400 c. c. in twenty-four hours. This urine was of a dark amber color and smoky. Tests for albumin and glucose were negative. Microscopical examinations showed an occasional granular cast, with a few pus cells and erythrocytes. The blood examination showed erythrocytes 4,750,000; leucocytes, 23,500; eighty-five per cent. polynu-

*Read before Section in Medicine, New York Academy of Medicine, February 17, 1920.

clears; twelve per cent. small mononuclears; three per cent. large mononuclears; hemoglobin seventy per cent. (Sahli).

Suspecting the possibility of a melanotic tumor, the test for melanin was applied to the urine and was positive. This excretion of pigment, which is one of the many interesting features of melanotic tumors, is brought about as follows: By the metabolic processes of its chromatophore cells the tumor produces an excess of melanin. This pigment enters the blood. It is excreted by the kidney glomeruli as pigment granules; or as others hold the melanin in the blood is changed by the liver to colorless melanogen, which is in turn excreted by the kidney. The test used to determine the presence of melanogen in the urine, to quote from Wells, is as follows: "True melanogen may be considered to be present in the urine. First, if the careful addition of ferric chloride causes the development of a black precipitate. Secondly, if this precipitate dissolves in sodium carbonate forming a black solution. Thirdly, if from this solution mineral acids precipitate a black or brownish black powder. All three of these reactions must be followed out for there are substances other than melanin which will give the first two reactions." As you will see from the specimens presented urine containing melanogen will in time turn deep brown or black through the action of the oxygen of the air or other oxidizing agents.

Within a few hours after admission, the patient's respirations had increased to sixty a minute, and the pulse rate to 160. She became progressively weaker and finally died at 2.10 a. m., October 27th, having been in the hospital forty hours.

Autopsy was performed in the afternoon of October 27th by Dr. Schwartz of the Gouverneur staff. Interest in the autopsy centres largely around the distribution of the metastatic processes. I shall quote largely from the autopsy protocol. The first general autopsy incision revealed the liver slightly enlarged, extending a finger's breadth below the costal margin. The gallbladder was distended and extended about three inches below the ribs. The peritoneal cavity was free from fluid; omentum adherent to the lower part of the right side of the uterus and the pelvis. The pleural sacs were practically obliterated, apparently by adhesion. The pericardial sac was distended and contained over an ounce of clear yellow fluid. The heart valves were normal.

Over the left ventricle and projecting from the surface were four firm masses about three eighths of an inch in extent, which on section were raised above the cut surface, grayish white in color, homogeneous, firm and well circumscribed. One nodule extended through almost the entire thickness of the left ventricle. The anterior mediastinal lymph nodes were the seat of a metastasis. The right lung was separated with great difficulty from the chest wall on account of the infiltration of the costal pleura and intercostal muscles with tumor growth. The right lung was lumpy in consistency, and projecting beyond the pleural surface and into the substance of the lung were numerous large, well circumscribed, oval tumor masses; these were

grayish white in color, firm, and homogeneous, some being three inches in diameter. The left lung showed similar processes, but to a lesser degree. However, in the centre of the tumor mass of the left lung were two blackish circumscribed nodules about three eighths of an inch in extent. Let me emphasize this, for these were the only ones of the enormous number of tumor masses which showed any black pigmentation macroscopically. There was a large tumor mass in the vault of the diaphragm.

The pancreas was hard, nodular, and was the seat of extensive tumor growth, only a small portion of the gland remaining uninvolved. The liver was normal in size; surface smooth and on section was slightly softened in consistency, and of a brownish color, studded with red markings throughout. There were no macroscopic metastases to the liver.

The gallbladder was distended and contained black bile. Its mucous membrane and that of the ducts were normal. The spleen was normal, there were no metastases. Thus there were two organs commonly the seat of secondary tumor growth in this case apparently uninvolved. The right adrenal gland was much enlarged and the centre contained a large tumor mass, grayish white in color, about two inches in width. This mass was soft and easily disintegrated. The left adrenal gland was normal.

The kidneys were normal in form and size, and contained numerous circumscribed grayish nodules; capsule stripped easily, surface smooth with the exception of the areas where the tumor masses projected beyond the surface. The peritoneal coat of the bladder contained several small growths. The bladder itself was normal. The uterus was much enlarged measuring ten inches in length, seven and a half inches in width and three and a half inches in thickness. It contained a fetus of about six months and a placenta. It might be of passing interest to mention that the test for melanin applied to the amniotic fluid was negative. The right ovary was enlarged and contained a tumor mass two inches in diameter which completely obscured any ovarian tissue; left ovary and both tubes were normal.

There was a firm tumor at the cardiac end of the stomach an inch in diameter. This was ulcerated through, and over it the mucous membrane was absent.

The mesentery contained numerous nodules of varying size and of the same grayish white homogeneous material. The retroperitoneal lymph nodes were enlarged and numerous; on section they were pink in color.

The large tumor mass on the back was incised and was found to be surrounded by, and to lodge entirely in muscle tissue. In the muscle of the lower right chest wall there were two small firm grayish areas about one half inch in diameter. There was also an extensive infiltration of the intercostal muscles as described previously.

Permission to open the cranium could not be secured, thus valuable information as to the possible seat of the original tumor or of extensions to the central nervous system could not be obtained.

SUMMARY.

Here is a young woman who carried a tumor growth five years, without subjective symptoms. Then some event which we can only conjecture applied the torch. Within four weeks from her first discomfort, she is brought into the hospital so acutely ill that the diagnosis on admission was pneumonia. The picture presented was not unlike many seen in fatal pneumonia: cyanosis, jaundice, rapid pulse, and extreme dyspnea. Considering the colossal lung changes can we wonder at these symptoms?

In reference to the distribution of the tumor masses: The absence of macroscopical change in liver and spleen was striking. Interesting features are the degree of involvement of the heart, pancreas and right adrenal. And the findings in the muscles were rather unusual.

The lack of pigmentation also is a point worthy of note. Only one of the tumor masses, that in the left lung, showed black deposits to the naked eye or under the microscope.

NEPHRITIS.

BY HYMAN I. GOLDSTEIN, M. D.,
Camden, N. J.

During the past eleven years I have met with many interesting cases of nephritis—especially those occurring in children and young adults following slight and severe infections, such as tonsillitis, appendicitis, and other affections. In calling attention to this type of kidney disturbance, I shall also include a general review of renal disease as ordinarily found in the every day practice of the internist.

It is much easier to gain a general understanding of nephritis and its complications by having in mind some simple classification of the various types of renal disease. Many classifications have been put forward—based on clinical, pathological, chemical and etiological factors. Such classifications, after all, must necessarily lead to a more thorough study and analysis of cases and the result is a better understanding of renal conditions as they are presented to the internist.

Before reporting some of my own cases, I will mention some of the classifications of kidney disease.

Christian prefers to classify nephritis according to renal function as: 1. Patients with hypertension without definite cardiac or renal insufficiency—primary or essential hypertension (hyperpiesia). In some of these cases albuminuria and cylinduria are only occasionally present. 2. Patients with hypertension with renal insufficiency—most of these cases in later stages show cardiac insufficiency—cardiorenal cases in the later stages. 3. Patients with renal insufficiency with or without hypertension—the latter when present having developed secondarily to the renal insufficiency—chronic nephritis with or without hypertension.

In group 1 considerable edema does not occur; in group 2 edema is frequently met with and when present is usually of cardiac origin, though it may be of combined cardiac and renal origin. In group

3 considerable edema occurs, but is not frequently met with; when it occurs it is of renal origin. In the cases where hypertension is present, signs of chronic myocarditis usually appear later until myocardial insufficiency becomes an important factor. Edema with fair renal function is almost always of cardiac origin (these cases respond to digitalis promptly); on the other hand, edema with poor renal function is usually of renal origin (these cases do not respond to digitalis or diuretics). Christian does not approve of the use of the terms interstitial, parenchymatous or glomerular nephritis.

It is bold and one hesitates to suggest that we try to diminish the use of the name of Guy's Hospital's famous physician, but the term Bright's disease is not a good one. It has no set meaning and is a bad term to use to tell a patient his trouble—to many this gives a hopeless prognosis and life of short duration is predicted, and is as bad a term as rheumatism.

Riesman classifies nephritis as: 1. Parenchymatous—a, acute; b, subacute; c, chronic nephrosis. 2. Tubuloglomerular nephritis—a, acute; b, subacute; c, chronic (the chronic tubuloglomerular type being the old chronic interstitial nephritis. 3. The arteriosclerotic kidney.

Stengel's classification is: 1. Acute; a, mild tubular; b, severe tubular; c, glomerular, always severe. 2. Chronic—a, tubular, mild; b, glomerular, severe; c, renal sclerosis or arteriosclerotic kidney (senile kidney).

Stengel's acute mild tubular nephritis is due to infections, etc. There is no severe renal (functional) disturbance, no kidney symptoms, no elevation of blood pressure. The urine may show some albumin and some casts; the specific gravity is constant. In the severe tubular form, there is considerable dropsy, no elevation of blood pressure, no blood changes. In the acute glomerular type, the disease is always severe, there is high blood pressure, and marked nitrogen retention in the blood.

The chronic tubular cases are nearly always mild, and go on for many years, the patients are of an alabaster white complexion, have no marked elevation of blood pressure and no marked nitrogen retention in the blood (no other marked blood changes). There is some albumin and casts; dropsy is present; no marked renal inadequacy present.

The chronic glomerular type presents an altogether different picture; these cases are usually severe; this is the most severe type we meet with. The urine is of a high specific gravity; albumin and casts may or may not be present; there is early nitrogen retention in the blood; there is marked renal insufficiency, and a markedly low phenolsulphonephthalein excretion. These patients die in uremia, and live only one or two years.

The renal sclerosis cases are even more mild, and even more so than the chronic tubular—without danger to health and may go on for many years (senile kidney). The patients are arteriosclerotic; renal tests show more functional activity; blood nitrogen retention is not great. The blood pressure is high, because these cases occur in elderly people with arteriosclerosis.

Fischer states that there is really only one type

of nephritis—parenchymatous nephritis. He calls them generalized and focal nephritis, primarily and secondarily contracted kidneys.

Aschoff divides nephritis into acute inflammations: 1, chronic inflammatory nephropathies; 2, chronic degenerative nephropathies, and, 3, chronic circulatory nephropathies.

Volhard and Fahr classify the nephritides as follows: 1. Nephrosis (degenerative)—a, acute; b, chronic; c, terminal contracted kidney; 2, nephritis (inflammatory)—A, diffuse glomerular nephritis; a, acute, b, chronic, c, terminal; B, focal nephritis—a, focal glomerular; b, acute interstitial; c, embolic; 3, arteriosclerotic kidney—a, pure arteriosclerotic (benign hypertension); b, combination form (malignant hypertension).

Senator's classification is practical and most familiar to the profession: 1. Acute nephritis; 2, chronic nephritis; A, chronic parenchymatous; B, chronic interstitial; a, primary chronic interstitial nephritis; b, secondary chronic interstitial nephritis; c, arteriosclerotic kidney; 3, diffuse nephritis—a combination of parenchymatous and interstitial.

Widal suggested three groups of renal cases: 1, salt retention; 2, nitrogen retention, and, 3, mixed salt and nitrogen retention cases. The combined type is more common than the simple salt or nitrogen retention cases. The pure salt retention type of nephritis show only edema. There is an entire absence of serious symptoms and signs such as twitchings, coma, convulsions, Cheynes-Stokes breathing, marked hypertension (200 mm., or over, of mercury, systolic), acidosis (Kussmahl breathing), retinitis, anemia, hardened arteries, enlarged heart, loss of weight. Any severe symptoms as these with or without edema represent nitrogen retention type of nephritis. Frequent weighing of an edematous patient gives us a guide as to the retention or excretion of fluids in the study of these cases.

The general symptoms and diagnosis of nephritis need not be dwelt upon in this paper—they are well known and described in detail in all textbooks of medicine. To make a careful study of a case of nephritis, one must know the functional capacity of the kidneys and the various tests proposed. All of these help to make a decision as to the proper treatment and the indication or contraindication to the use of drugs.

As mentioned, weighing an edematous patient (if the condition warrants this with safety) is of considerable help as a guide as to retention or excretion of fluids; the study of salt excretion; tests for acidosis; study of the excretion of nitrogen waste products by chemical examination of the blood for urea. Study of the amount of phenolsulphonephthalein output and finally studies of the concentrating ability of the kidneys over a twenty-four hour period by the so-called renal test meal will show whether there is a true hyposthenuria (constant low specific gravity), and whether the kidneys can excrete concentrated urine with normal amounts of solids or not.

If renal function as measured by our functional tests is poor and the patient's condition indicates no serious disturbance in any other organ than the

kidneys, the probability of any great improvement in renal function is slight, except in cases of acute nephritis. Where the phenolsulphonephthalein test can be done, it is of service for the general practitioner. In the mild cases the phthalein excretion is normal or slightly depressed. In mild cases, too, blood urea N is normal or almost normal in value (unless the patient is on a high proteid diet) and therefore offers much help. It serves as a check on the phthalein test. The McLean or Ambard coefficient index in such cases is sometimes normal—often, however, this helps in making a prognosis. In the mild cases the two hour test is particularly useful, and in these cases if phthalein excretion is normal, the patient is placed on a diet containing seventy-five grams of protein and four grams of salt for two days and on the third day special meals—Mosenthal or Christian—the Frothingham or Schlayer and Hedinger diets are given, and the urinary collections of the two hour test are made.

A patient showing an excretion of thirty-five to forty-five per cent. phthalein is classed as a moderate renal case. Many of these cases, however, have cardiac disturbances with edema. In this type of case, in addition to the phthalein test, the renal function can be further learned by the administration of a diuretic such as agurin, theocin or theophyllin, diuretin or theophorin and if the edema improves with prompt diuresis, renal function is good, if not, renal function is poor and the prognosis is not so good.

Patients with less than thirty-five per cent. phthalein excretion have poor renal function and if patients do not have any cardiac disturbances, it usually means a severe kidney disease and offers a poor prognosis. Properly used tests of renal function are an aid in the treatment and management of renal cases and help in giving a more nearly accurate prognosis.

Thus, where the blood urea nitrogen continues to rise, we may be reasonably certain and so inform the relatives of the patient, that uremia is impending. Normally, the blood contains about twenty per cent. total solids; total nitrogen three per cent.; sugar .012 per cent.; chlorides as sodium chloride .65 per cent. and cholesterol .15 per cent.; nonprotein nitrogen twenty-five to thirty mgms. to the one hundred c. c. of blood; urea nitrogen twelve to fifteen mgms.; uric acid one to three mgms., creatinine one to two and a half mgms., creatine five to ten mgms. to the one hundred c. c. of blood.

In chronic nephritis the blood may show thirty to eighty mgms. nonprotein nitrogen and fifteen to fifty mgms. to the one hundred c. c. blood of urea nitrogen; in uremic nephritis you may get 120 to 350 mgm. nonprotein n, and eighty to 300 mgm. urea n, to the one hundred c. c. of blood—in these absolutely fatal cases you may have five, ten or fifteen mgms. uric acid per one hundred c. c. and creatinine up to thirty mgm. or more in one hundred c. c. of blood.

Myers and Lough and Gradwohl contend that the presence of over five mgms. of creatinine in one hundred c. c. of blood indicates an absolutely fatal prognosis. Blood chemical tests will help in differentiating so called cardiovascular disease from cases

of primary renal disease with secondary cardiac disturbance and lack of compensation. Blood tests in cardiovascular disease show practically no retention of nitrogen waste products, whereas nephritics with failing hearts show nitrogen retention.

Another point to be emphasized is that even in bad cases of nephritis urinary findings may be negative or scant so far as albumin and casts are concerned, yet an undue accumulation of urea *n*, uric acid, and creatinine will be found in the blood, and therefore the chemical blood work becomes at once a valuable method of estimation for true kidney function. Uric acid is the most difficult of all three (urea *n*, uric acid, and creatinine) for the kidneys to get rid of, urea next, and creatinine is eliminated with the least difficulty by the kidneys. Therefore, the staircase effect of Myers and Chase, emphasized by Gradwohl and others, is easily understood; first, uric acid is retained in early chronic nephritis, next as the case advances, urea *n* is retained, and finally creatinine. The uric acid retention occurs early in chronic interstitial nephritis, this is similar to the uric acid retention which occurs in gout. The urea is estimated by the Marshall method, the uric acid by the Folin method. (The Hellige colorimeter is used in all cases by Gradwohl). The Duboscq colorimeter is used by others.

The blood for these tests should be collected before breakfast, similar to the manner in which blood is taken for the Wassermann reaction. Potassium oxalate solution or a few crystals of the oxalate are put in the tube and the blood is well shaken. Amylase (amylolytic action) of urine is reduced in nephritis.

Uric acid is the first of the nitrogenous substances to be retained in interstitial nephritis.

Since gout and very early interstitial nephritis are characterized by essentially the same blood picture, it is necessary to employ every possible test to exclude nephritis before a high blood uric acid may be regarded as evidence of gout in the absence of the classical clinical manifestations.

Mosenthal and Lewis place considerable importance on the Ambard coefficient of urea excretion in their comparison of this method and the renal test meal with the Geraghty and Rowntree functional kidney test by means of subcutaneous injection of phenolsulphonephthalein. Others, while they admit that there seems to be something advantageous in this estimation of the ratio between the amount of urea in the blood and the amount of rate or urea excretion in the urine, quote the conclusions of Addis and Watanabe, that the rate of urea excretion in man varies under physiological conditions in a manner that cannot be explained by the concentration of urea in the blood and urine. The normal Ambard coefficient is .08; however, with the Dorémus ureameter, Gradwohl finds this test to be unreliable. McLean and Selling, with the Marshall method of urea *N*, estimation, have worked out another coefficient, which is more exact (the index of 100 is normal for McLean's coefficient).

Folin and Denis, Fritz and Frothingham showed (in experimental uranium nephritis in rabbits) that the retention of the nonprotein nitrogenous blood

constituents represented the difference between the quantity eliminated and the amount produced, whereas the Geraghty-Rowntree phenolsulphonephthalein test served as an indicator of elimination alone. Therefore, the blood chemical examination (for urea nonprotein) is the most valuable of all renal tests. The amount of nonprotein and urea in the blood is a measure of accumulating difference between the waste produced in metabolism and the amount eliminated by the kidneys.

ACIDOSIS.

By Van Slyke's estimation of the combining power of the blood plasma for carbon dioxide we may find exactly how much carbon dioxide a patient's blood plasma may take up and in that way determine the onset of uremic (nephritic) or diabetic acidosis. Normally, in the state of relative alkalinity of blood plasma, about sixty-five per cent. of the carbon dioxide will be taken up. As the acid bodies form which are part of the chemical changes seen in the blood acidosis, the blood loses this power to combine with carbon dioxide so that when the figure of fifty or less is reached, the patient is in danger of impending acidosis. This is more important than the finding of acetone, diacetic acid, or other constituents in the blood. The plasmas of normal adults contain from fifty-five to seventy-eight volumes per cent. of combined carbon dioxide as determined by Van Slyke's method. As stated, the bicarbonate content of the plasma is determined by measuring the carbon dioxide given off after the addition of an excess of acid. In the determination of the bicarbonate reserve of the plasma, it is found that in infants the normal values average about ten per cent. lower than in adults. Figures lower than fifty in adults and forty-five in infants are indicative of acidosis. The results if multiplied by seven tenths approximate alveolar carbon dioxide tension in millimetres determined according to the Marriott method (Van Slyke).

The determination of the carbon dioxide tension in the alveolar air (Marriott's method) may be carried out at the bedside. In normal children at rest, the carbon dioxide tension in the alveolar air varies from forty to forty-five. Tensions of between thirty and thirty-five millimetres are indicative of a mild degree of acidosis. When the tension is as low as twenty millimetres, the patient is in imminent danger. In coma, with acidosis, the tension may be as low as eight or ten millimetres. In infants the tension of carbon dioxide is from three to five millimetres lower than in older children or adults.

SELLARD'S ALKALI TOLERANCE TEST.

When the bicarbonate content of the plasma is within normal limits, the administration of a small amount of sodium bicarbonate by mouth raises the amount in the blood and brings about an alteration of the reaction of the urine. The excess of bicarbonate is excreted and the normally acid urine becomes amphoteric or alkaline. When there is acidosis, the bicarbonate of the plasma and of all of the body tissues is diminished. This must be replenished before bicarbonate by mouth will be excreted by the kidney. Therefore, the amount of

sodium bicarbonate that must be given to produce an amphoteric or alkaline urine is a measure of the depletion of the bicarbonate reserve of the body. With infants two or three grams of sodium bicarbonate is sufficient to cause an alkaline reaction of the urine; with older children and adults five grams are required. When acidosis is present much larger amounts of soda are necessary to bring about this change—sometimes five or ten times as much may be required. I take this opportunity to include these tests for acidosis, because we may have acidosis of renal origin.

The ability of the kidneys to excrete acid, especially acid phosphate, is one of the chief defensive mechanisms of the body—and failure of this mechanism leads to acidosis. In nephritis, when acidosis is present, there is an accumulation of unexcreted phosphate in the blood plasma. In these cases of acidosis, hyperpnea is present, the carbon dioxide tension in the alveoli is lower than normal, the alkali reserve of the blood is depleted and there is an increased alkali tolerance. No acetone bodies are detected in the urine and the ammonia nitrogen excretion in normal or diminished in cases of the acidosis of nephritis.

W. W. Palmer and L. J. Henderson have shown that nephritis commonly involves a state of acidosis. They conclude that the urinary concentration of ionized hydrogen is increased in the various forms of nephritis; and that acidosis is frequently present in renal cases—because when alkali (sodium bicarbonate) is administered it is in these cases retained by a kidney capable of the rapid elimination of an excess of alkali.

Marriott and Howland have shown that acidosis occurs in nephritis and the kidneys fail to excrete acid, especially acid phosphates, and they found an accumulation of unexcreted phosphate in the blood plasma. Henderson and Palmer have also shown that in every case of nephritis in which the condition of diminished ammonia excretion was detected, there has been a real retention of alkali. This is also commonly the case in other types of nephritis, even with heightened ammonia excretion.

Other methods used in the study of acidosis are the Marriott method for the determination of the hydrogen ion concentration of the blood or the indicator dialysis method for the determination of reserve alkali and the Barcroft and Peters quantitative method for the detection of acidosis—this latter test has for its basis the fact that the combining power of hemoglobin for oxygen is dependent upon the reaction of the blood. In acidosis the combining power is regularly diminished.

The Fredericia Plesch method may be used for the determination of the carbon dioxide in alveolar air.

Sellards' serum test consists in the precipitation of the proteins of one c.c. of serum by twenty-five c. c. of neutral absolute alcohol. The mixture is shaken and filtered through a dry acid-free filter paper. To the filtrate a drop of phenolphthalein solution is added and the fluid is evaporated to dryness on a water bath. Normally, a deep reddish purple color develops. In severe acidosis, there is a faint pink color or no color at all, but the addition

of a drop of water brings out a red color. In extreme acidosis the residue is colorless and remains colorless on adding water.

In acidosis due to an overproduction of acetone bodies, acetone, oxybutyric and acetoacetic acid appear in the urine in sufficient amount to be detected by qualitative tests.

But these are not enough to serve as a basis for the diagnosis of acidosis. Acetonuria is exceedingly common with sick children; it is almost regularly present in febrile disease and in any condition in which temporary inanition or starvation occurs. Very seldom is the production of the acetone bodies sufficient to cause a depletion of the alkali reserve. From acetonuria alone the diagnosis of acidosis should not be made, though where the amount in the urine is very large, it should inspire a careful examination for additional evidence of acidosis. Severe and fatal acidosis may occur with no overproduction of the acetone bodies. Their absence from the urine is no evidence that acidosis is not present. Recently Marriott, Hoessler and Howland have called attention to a method of determination of acidosis that occurs with the nephritic state. They state that the acidosis met with in nephritis is unlike that of diabetes; namely, an accumulation of acetone bodies; it is rather due to a failure to regulate the formation of acid substances by the kidneys, a failure to eliminate acid phosphates. Their method looks to the estimation of the inorganic phosphates in the blood. The normal figure expressed in terms of phosphorus varied from one to three and a half mg. to the one hundred c. c. of blood. In nephritic acidosis, they found it increased invariably to many times the normal, as much as twenty-three mg.

The definition proposed by Henderson and quoted by Austin and Jonas for acidosis—is any condition in which the buffer substances of the blood and body fluids are reduced below the normal. Henderson calls the sodium phosphate and sodium carbonate (phosphoric acid and carbonic acid) of the blood and body fluids buffer substances.

Finally, Christian states the most delicate test of renal damage that we possess is the presence of albumin and casts, leucocytes or red blood cells in the urine in varying combination. They are never absent in all of several specimens on different days if there is renal damage—though single examinations may fail to reveal any even in patients with severely damaged kidneys. Their presence does not justify the diagnosis of nephritis unless supported by other data, though their continued absence justifies the conclusion that the kidney is free from nephritis (a diffuse, progressive, degenerative, proliferative lesion of renal parenchyma or interstitial tissue or both).

HYPERTENSION.

Hypertension, as shown by Schneider, may be due to many causes. We are now interested in only one phase of the subject—namely, that type of chronic vascular hypertension which has been called primary vascular hypertension, essential benign hypertension, essential hyperpiesia of Albutt, Gull and Sutton's disease. These cases may show a high blood pressure for many years without definite

urinary findings, and with surprisingly few symptoms. Eventually after many years, these patients do show some capillary fibrosis, with an increase in cardiac failure and increase in renal insufficiency, and at autopsy show extensive thickening of the small arteries and the changes in the kidney look as if they had come as the result of the arterial disturbance. Many other patients with hyperpiesia appear to die with the same combination of signs and symptoms before the peripheral vessels (except the larger ones) show any appreciable change. Gull and Sutton's disease probably represents the advanced or late stages of Christian's primary vascular hypertension.

In a study of one hundred cases of hypertension, Schneider found twenty-six arteriosclerotic, sixteen diffuse nephritic, twenty-five granular kidney, two climacteric, seventeen benign, one surgical kidney, two cystic kidney, four vascular syphilis, three thyrotoxic and four were asphyxial.

Riesman and Hopkins have recently emphasized the cases of hypertension occurring in women between forty and fifty years of age. Some of these women have had many children, some none at all, some showed urinary findings and had symptoms, others had no complaints traceable to the high blood pressure—and got along very well on a regulated diet and rest. Some of these climacteric patients were relieved by the administration of benzyl-benzoate. (Macht), corpus luteum and thyroid. The nitrates and iodides are not beneficial. The blood chemical tests in these cases are normal or nearly normal—the urea N, uric acid, and creatinine are not noticeably increased. At times the hyperpiestic heart becomes decompensated and then some medical treatment is necessarily indicated. It is to be remembered, therefore, that the chronic nephropathies are not to be held accountable for all cases of vascular hypertension—although nearly all cases of persistent high blood pressure eventually do show some renal sclerosis and cardiorenal disturbance.

Clifford Albutt, in 1903, called attention to the fact that the hypertension in a certain proportion of cases was primary and the sclerosis secondary, although the prevailing opinion held at that time was that hypertension was always secondary to arteriosclerosis or nephritis.

Stengel, in 1914, dwelt on the occurrence of cases of arteriocapillary fibrosis (Gull and Sutton's Disease) and noted cases of primary arterial or arteriolar disease with insidious onset. Meara (1), described cases of essential hypertension occurring in ruddy, stocky patients with plethoric habits, and active temperament.

Essential hypertension, or Albutt's hyperpiesia, is essentially chronic in course and ends ultimately in a definite nephritis with sclerosis of the renal vessels, cardiac hypertrophy, and arteriosclerosis, the end result being either cardiac failure, or an arterial accident, cerebral or coronary. These patients rarely die of uremia. Usually they are apparently in robust health, have a florid complexion, are plethoric, and have excellent appetites. These cases usually begin in late middle life. The earliest complaints are increasing dyspnea on exer-

tion and sometimes precordial pain. Meara reports a case of this type in a boy eight and one half years old, in whom the trouble began at the age of five years. After all, these cases may be in the prealbuminuric stage of chronic interstitial nephritis (Mahomed) or the presclerotic stage of arteriosclerosis (Huchard).

OTHER TESTS.

Indigocarmin and methylene blue (from five to fifteen minims) in five per cent. solution when injected into a patient will under normal circumstances color the urine blue in an hour and in twenty-four to twenty-eight hours the dye is completely eliminated. In nephritis the excretion begins later and lasts much longer—several days.

Iodide of potassium, seven and one half grains, when given the excretion of iodine in the urine lasts about twenty-four to thirty-six hours in healthy persons, while in nephritis this may last for four or five days (F. Müller).

Rowntree and Geraghty's phenolsulphonephthalein test has now become the one most commonly used. Phthalein ampoules containing the monosodium salt, in sterile solution (.006 in 1 mil.) can now be obtained, and the Dunning colorimeter is on the market. For the rapid estimation of urea, in the urine and in the blood, urease tablets (twenty-five mgm. may be used). Rapid acidosis testing outfits for estimating the alkali reserve of the blood, the alveolar air carbon dioxide tension, and the hydrogen ion concentration can also be obtained at moderate cost.

The electric conductivity in nephritic urine is often diminished, and the same is true of the blood. The resistance to electric conductivity of a fluid depends upon the amount of electrolytes—i. e., dissociated ions of inorganic salts contained therein. Increased concentration of the salts adds to the electric conductivity.

The freezing point and boiling point of a solution are dependent upon the number of molecules present in it. The fewer the solid constituents the kidney excretes, the less will the freezing point of the urine be below the freezing point of distilled water. Under normal conditions this lowering is about 1° to 2.3° C. below 0°. If it is less than 1° C., an insufficiency of the kidneys is probable.

The freezing point of blood normally is about 0.56° C. below that of water. In disease of the kidneys it sinks lower. In uremia it is as low as 0.70°—75° C.

BLOOD PRESSURE.

In estimating the blood pressure in my cases I always use the auscultatory method of Korotkow. This is the simplest, most satisfactory and accurate method. In cases where the heart is irregular in force and rhythm it becomes impossible to make accurate observations of systolic and diastolic pressure. In such cases Warfield advises taking the average reading between the point where the strongest beat is heard and the point where practically all beats are heard as the systolic pressure. The diastolic pressure is best taken at the point where no sound is heard except the occasional sound produced by an excessively strong beat. The first

audible sound occurs at systolic pressure; the diastolic pressure should be read at the sudden transition of the third clear tone to the dull fourth tone and just before the disappearance of all sound.

Diastolic pressure is important as it measures the peripheral resistance; the pulse pressure measures the actual head of propulsive force in the arteries at the base of the heart. Normally, the pulse pressure is forty to forty-five mm. of mercury. The cause of hypertension is not exactly known. Macht and Voegtlin have isolated a crystalline substance from human blood which they regard as a lipoid and related to cholesterin. This substance was recovered from the cortex of the adrenal gland. There may be something in the circulation, therefore, that produces constriction of the vessels. Speaking of hypertension in women Riesman says it may be set down as a general rule that hypertension in women under thirty-five years of age is practically always nephritic, it gives a bad prognosis, much worse than any other form of hypertension.

UREMIA.

There are two forms of uremia. Chloridemia, eclampsia of Volhard, is due to arterial hypertension, and edemas caused by retention of water salines—i. e., mechanical in origin. This is a pseudouremia. Azotemia, or true uremia, is due to some excess accumulation of toxic substances. These poisons are largely nervous poisons. Uremia holds the same relation to nephritis as coma to diabetes. The real cause of uremia is not known.

Traube believed uremic symptoms were dependent upon an acutely developing edema of the brain and consequent cerebral anemia. Frerichs assumed that through fermentation, the urea in the blood of nephritics was converted into carbonate of ammonia. Some experiments seem to point to potassium salts as the poisonous agents. Some workers laid the blame for the condition on extractive matters, as creatinin. Bouchard, Acoli and others thought that the urotoxins (alkaloid substances), nephrolysin, nephrotoxins, caused the kidney cells to break down and act as poison (product of disintegration of the tissues) Brown-Séguard. Some traced the uremia to a disturbance in renal internal secretion.

Noncoagulable nitrogen, the nitrogen remaining in the blood after the complete precipitation of albumin, may play a part. Hughes and Carter conclude that the poison is of an albuminous nature. Rose Bradford showed an extraordinary increase in the production of urea of the nitrogenous bodies like creatinin and creatin, and that it profoundly influenced the metabolism of muscle tissue.

Fleischer found urea in the saliva and sputum of a uremic patient. Schottin first described a coating (lustrous scaly) of urea on the skin and the sides of the nose in uremia. Urea does not cause uremia. Widal thinks it does. Ammonia nitrogen does not cause uremia. Martin Fischer states that an acid intoxication of the brain caused edema of the brain cells and uremic symptoms resulted.

There is an accumulation of rest nitrogen (non-coagulable nitrogen) in the blood, in uremia with convulsions, but it has not been proved to be the

cause of uremia. Foster thinks he has discovered the causal toxic crystalline substance in uremia. Indicanemia is not the cause. Foster describes several types of uremia: 1. Retention type of uremia, due to obstruction of ureters (complete occlusion) or if a surgeon by mistake removes an only kidney, or if both kidneys do not functionate, death occurs in stupor and without convulsions. 2. Cerebral edema type occurs in acute parenchymatous and glomerular nephritis. Symptoms of cerebral compression due to edema of the brain, and death occurs without convulsions. 3. Toxic or epileptiform or classical or convulsive type, occurs with local and general twitchings and convulsions. It is in this type that Foster thought he discovered the causal poison of uremia.

SYMPTOMS OF UREMIA.

The pulse is often very slow, forty to fifty, before the appearance of severe symptoms. There is a disturbance of the cerebral visual centres, particularly of the occipital cortex, resulting in amaurosis. Delirium and maniacal or melancholic states occasionally follow uremic coma. Uremic vomiting is often persistent, it may be central in origin, but it is also due to gastric irritation from eliminated urea.

Uremic diarrhea is provoked by the carbonate of ammonia arising from the urea in the intestines. The disturbances in uremia are almost exclusively cerebral and in the main located in the cortex of the brain. They are probably due to a direct injury of the nervous elements, possibly also to spasm of the blood vessels.

The most characteristic symptom of severe uremia is the uremic convulsion. Headache, precordial distress, vomiting, peculiar restlessness, itching of the skin, are important symptoms in milder forms of uremia. Uremic amaurosis usually remains after recovery from the convulsions and usually develops quite rapidly. A lustrous scaly coating of urea may be observed on the sides of the nose in these uremic cases.

Fischer says the "consequences of kidney disease are not consequences but are the same thing as the kidney disease manifested in the different organs of the body and all due to the same poison which originally produced the kidney change." He attributes the headache, stupor, coma, and convulsions of uremia to an edema of the brain, the changes in sight to an edema of the optic nerve or retina, the vomiting to an edema of medulla and the general edema to a swelling of the body tissues generally, all induced through the same poison circulating through the body and responsible for the edema of the kidney (nephritis). He believes water is the only true diuretic.

Nervous symptoms.—Uremic hemiplegia is characteristically transient, changes may occur in a few hours. These cases must be differentiated from cerebral hemorrhage and thrombosis. Aphasia which is renal in origin clears up commonly, with an improvement of the condition. It must be remembered, however, that a uremic patient may also have a cerebral hemorrhage.

(To be continued.)

Editorial Notes and Comments

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PHYSICIAN AUTHORS—DR. DAVID
RAMSAY.

It is said that Napoleon during his exhaustive military campaigns was able to thrive on five hours' sleep a night, and sometimes less, and deemed more than that amount of slumber unnecessary. There have been those who required even less sleep, and one of these was that indefatigable patriot of the Revolutionary period, Dr. David Ramsay. It is related that Dr. Ramsay would sleep only four hours a night, arising before daylight and devoting his entire time to hard, systematic work. It is not surprising that with all this intensive industry Dr. Ramsay was able to take care of a large medical practice and at the same time dash off something like thirty volumes of history and miscellaneous writings, in addition to taking an active part in all public and philanthropic enterprises in his home city, Charleston, South Carolina.

Dr. Ramsay's numerous volumes of Revolutionary history are not only excellent narratives in themselves, but they have also been veritable storehouses of information from which succeeding historians have been able to gather a vast amount of material. He was peculiarly fitted to give to America its first written accounts of the War of Independence, for he was not only an exceptional man, but also one who enjoyed exceptional advantages. As a member of the Continental Congress he had access to all official documents, and he tells us in his preface that he went carefully

through these, gathering notes and data. Similarly, he made a careful perusal of all Washington's letters and those of the other general officers and members of Congress. Throughout the Revolution, despite his numerous patriotic activities, he busily gathered material for the volumes of history which he wrote after freedom had been attained. As a further help in the compilation of his histories, Dr. Ramsay was blessed with a retentive memory and a fine sense of discrimination, and he was a keen observer of men and events. As a writer he was lucid, direct and forceful, and his descriptions of battles and characterizations of men were clear cut, vivid and exact.

In a way, Dr. Ramsay had been a sort of child prodigy. Born on a farm in Lancaster County, Pennsylvania, on April 2, 1749, of Irish parents, he displayed rare talents at an early age, and was uncommonly proficient in his studies at school. When he was twelve years old he became a tutor in an academy at Carlisle, Pa., and after a year in that occupation he entered the College of New Jersey, now Princeton University, from which he was graduated in the class of 1765. He then began teaching school in Maryland, and it was not until after several years of this that he decided to become a physician. He was graduated from the University of Michigan as an M. D. in 1773, and settled in Charleston, where he rapidly built up a large practice.

Although Dr. Ramsay had been an ardent patriot in his younger years, it was in Charleston that he gained prominence throughout the colonies by reason of his unflinching advocacy of the colonies' rights. The part he played in the Revolution was a large one—as member of the South Carolina Senate, as member of the Continental Congress, as field and hospital surgeon, and in various other capacities. When the British captured Charleston in May, 1780, Lord Cornwallis ordered that Dr. Ramsay be put in prison at St. Augustine, Fla., to curb his anti-British activities. As a public speaker and member of the Council of Safety at Charleston, Dr. Ramsay had long been a thorn in the side of the British. He was detained at St. Augustine eleven months. Two years later he was elected to the Continental Congress and reelected in 1785. During his second term he served for one year as president *pro tempore* during the illness of the famous John Hancock.

The History of the Revolution in South Carolina was Dr. Ramsay's first published work, issued in

two volumes in 1785, followed four years later by his *History of the American Revolution*. Dr. Ramsay wrote the first *Life of Washington* (published in 1807), with whom he was personally acquainted, and the biography stands today as one of the best and most authentic of the numerous biographies of the Father of His Country.

The most pretentious of Dr. Ramsay's works was his *Universal History Americanized*, in twelve volumes, which included three volumes of his *History of the United States from the First Settlement in 1607 to 1808*.

Dr. Ramsay's writings included three works of more or less direct interest to the medical profession—one entitled *The Means of Preserving Health in Charleston and Vicinity*, published in 1790; a *Review of the Improvements, Progress and State of Medicine in the Eighteenth Century*, published in 1802, and a *Eulogium of Dr. Benjamin Rush*, published in 1813.

Despite his literary activities, Dr. Ramsay continued his professional practice in Charleston from 1786 until his death in 1815. His influence seems to have been great in every department of life. He was always in demand to address public gatherings, and is reputed to have been a forceful speaker. He was twice married, his first wife being Frances, the daughter of the Rev. John Witherspoon, president of Princeton University, and the second wife Martha, daughter of Henry Laurens, of Charleston, a woman of rare accomplishments, as extracts from her diary, included in Dr. Ramsay's *Memoirs of Mrs. Martha Laurens Ramsay*, show.

Dr. Ramsay, notwithstanding a tremendous expenditure of energy throughout his life, was said to be in vigorous health when he was shot by a lunatic against whom he had testified as an alienist. He died as a result of his wounds on May 8, 1815, at the age of sixty-six.

THE TRUE BASIS FOR PENAL REGULATION.

Genuine self interest can never stand in antagonism to the best and most workable altruism. It is rather the basis of the latter. Honest and thorough investigation of an individual self or of society would not fail to recognize this. But the individual self has lazily and timidly stopped short of such investigation, and so has collective social understanding. Stopping less than half way, both have failed to penetrate to real motives or to the basis out of which all motives primarily arise. Here their sincerity must be put to the test, and their genuine self interest find not only its natural justifi-

fication, but its origin as a spring for all service rendering behavior. In the sphere of penal regulations and activities we are slowly realizing how seriously the race has allowed certain partial conceptions to obstruct the more honest penetration which involves time and trouble, a good deal of both. Such partial conceptions dominate the thought and the method of civilized society.

Enrico Ferri, writing of The Reform of Penal Justice in Italy (*Archivio di Antropologia criminale, Psichitria e Medicina legale*, Vol. XL, No. 1, 1920), says that two principles have formed the basis of the administration of justice. Neither of these has truly served the principles of self interest, for they have been only blindly applied to this end. The two principles which are in play, the writer says, are that of defense of the state against the individuals who threaten it and that of penalty measured only according to the gravity of the offense. Society in its attitude toward penal questions has forgotten or completely lost sight of its own best defense, its own best interest, as contained in an understanding of the real nature of the criminal and of the crime from his point of view. The time and trouble involved in this are more than society is in the habit of spending upon any of its questions or upon any one of its individuals, except in the negative way of patching up damages done, repairing the ravages due to a crime, and putting into action the extensive machinery of apprehension and punishment of the offender. The trouble of investigation that would lead to preventive action in the case of the individual delinquent and to a thorough apportionment of the treatment of each delinquency in order to get the best positive returns in the long run for society itself has not seemed worth while. This study from Italy reminds us again that such unreasonableness and lack of real self interest on the part of society are coming to be recognized as the starting point for some more effective manner of viewing the question.

The writer refers to Christ's injunction that one man shall not judge another. The logic of this command lies in the fact that one man cannot judge another. He has not possession of the elements on which such judgment could be based. It is necessary to know the internal world which belongs to the offender really to pass sentence that should fit the crime. This includes a knowledge of the individual's heredity, of the environment, intrauterine and extrauterine, by which his early life was surrounded, and of all his later family and social surroundings. Could this all be known, the question for social regulation would not yet be one of

punishment. Who is even society, one might ask, to mete out measure for measure, the payment for a social crime? The crime itself and its injury to society are not something which can be put in the balance and compensated for. The practical duty, one which serves the interests of every one, and by this alone protects society, is to determine how best to redirect these tendencies, these psychological determinants, which, in addition to environmental pressure, have resulted in criminal acts. Enacted laws against crime can, as the writer states, only partially eliminate the effects of crime. They do nothing toward its causes, and therefore do not defend against repetition.

Alteration of causes can be attained only by the larger psychological knowledge; by providing better social conditions, and aiding the individual in his adaptation to these. There can also be more direct and efficient prevention through police agencies and special educational provision for those who are deficient in adaptive power, because of deficient intellect or otherwise. There should also be personal attention directed toward the condemned from the time of their apprehension to that of the carrying out of their sentence and at their return to society. Agricultural and other colonies are suggested as wise provision for those under punishment. A strong plea is made for special educational training for the officials who have the penal work in hand. Psychology, medicine, anthropology, and criminology should be in their course of study.

TABES AND FACIAL PARALYSIS.

When facial paralysis occurs during tabes a certain number of questions are to be considered if a correct diagnosis and prognosis are to be made. The first question, is there really facial paralysis, simple as it appears may necessitate a long and minute examination, and for making a conclusion the state of contracture of the face, the exaggeration of the asymmetry on the slightest movement, the deviation of the tongue, and spasmodic twitching of the eyes and lips must be looked into. In some cases the asymmetry that one is prone to attach to the paralysis may be the effect of ataxia of the face. The patient may also limit the movements on the side of the face, either because of the violent pain occurring with each motion or because of a true paresis indirectly related to the involved sensitive portion of the trigeminus. Finally, tabetic hemiplegias exist, but their description is too well known to require comment.

If facial paralysis really exists, the second question is whether the paralysis is really tabetic. In

some cases paralytic associations may distort the face so that a pseudobulbar paralysis may be considered, in which case the reflexes are not abolished. A glossolabiolaryngeal paralysis might also be diagnosed, but here there are no ocular manifestations or sensitive or sensory phenomena. But confusion generally is not possible and the real point to settle is whether the facial paralysis is tabetic or is a facial paralysis occurring in an ataxic subject. A tabetic is both a nervous and syphilitic subject and each of these conditions is susceptible to facial paralysis.

As a nervous subject he may be hysterical and a true hysterical paralysis may develop, although this is rare. A careful study will always detect some peculiarity, such as irregular distribution occasionally supplanted by true spasmodic paroxysms almost constantly accompanied by sensory manifestations. On the other hand, hysterical facial paralysis is a manifestation of a hysterical syndrome, always serious and frequently giving rise at the same time with the facial hemiplegia to a total hemiplegia or a hemianesthesia. In the ataxic there may develop a facial paralysis *a frigore* from the most trivial causes. It is usually easy to recognize a nuclear paralysis and to differentiate it from a purely neuritic paralysis; the distribution is not the same, the evolution is in every way different; the extent and the intensity, especially at the onset, may be infinitely more marked in a *frigore* type. On the contrary, it is a delicate matter to differentiate a pretoxic paralysis from facial paralysis. The benign characters and the rapidity of evolution are not the appanage of tabetic paralysis only; they are merely presumptive characters. But always when a tabes is distinctly evident as well as the symptoms of the onset—fulgurating pains, the Argyll Robertson, Westphall, and so on and above all if the tabes appears to claim this somewhat special character that Brissaud has described under the name of paralytic tabes—the physician will be authorized to relate every instance of nonsymptomatic facial paralysis to the tabes in evolution.

The tabetic being a syphilitic, there are several good reasons for a facial paralysis developing during the secondary phase of syphilis, as tabes is always a late manifestation, but during the tertiary phase syphilis has multiple means of producing functional impotency of the facial nerve. First, there is the basal meningitis which involves the third and fourth cranial pairs. The auditory nerve frequently gives rise to hemianosmia with preservation of tactile sensibility of the nasal mucosa on the same side; it also provokes an extremely marked leucocytosis as revealed by examination of the cere-

brospinal fluid. Luetic meningeal gummata may be seated at the point of exit of the facial nerve, more rarely over the convexity of the brain; occasionally even a large surface of the meninges is involved by the gummatus or sclerogummatous process. Much more rarely the nerve itself appears to be directly involved, but gummatus neuritis is so exceptional that from the viewpoint of diagnosis it need scarcely be taken into consideration. Great consideration should be given to bone lesions—exostoses, gummatus periostides—compressing the seventh pair in its course along the Fallopian aqueduct. Such cases are easy to eliminate because tabetic facial paralysis is exceptionally isolated. However, the fact that the patient has tabes will be greatly in favor of a diagnosis of facial hemiplegia and above all the test by treatment—positive in syphilitic lesions, negative in tabes—will be conclusive.

As to the third question, namely the nature and origin of the paralysis, there will be no difficulty in typical cases. The rapidity of evolution, the general involvement of the face, the appearance of the paralysis at the onset of the tabetic symptoms, the suddenness of appearance and disappearance, and their benign course are all characters—although relative—which assign them to a neuritic origin. Their incurability, progress, the exclusive involvement of the lower territory of the face, the association especially with other paralyzes of nuclear origin, are elements of almost certain nuclear origin.

News Items.

Tri-State Medical Meeting.—The Tri-State District Medical Society of Iowa, Illinois and Wisconsin will be held October 4th to 7th at Waterloo, Iowa.

Minnesota Medical Meeting.—The annual meeting of the Minnesota State Medical Association will be held September 29th to October 1st in St. Paul.

Southwest Medical Meeting.—The Medical Association of the Southwest will hold its fifteenth annual session September 27th to 29th at Wichita, Kan., under the presidency of Dr. E. F. Day, of Arkansas City, Kan.

Dysentery in Poland.—Dispatches from abroad state that dysentery is epidemic in the Polish army. At one Red Cross station where about 4,000 men are received daily, four fifths of the arrivals are said to be suffering from dysentery.

Fiske Fund Prize Awarded.—The Fiske Fund Prize of the Rhode Island Medical Society has been awarded to Dr. Allen G. Rice, of Springfield, Mass., for his dissertation on Surgical Lessons of the Great War.

Death of Professor Guyon.—Word has come from Paris of the death of Professor Feliz Guyon, senior surgeon of the Hôpital Necker, and a former president of the Academy of Sciences and the Academy of Medicine, Paris.

Child Hygiene Conference.—The American Child Hygiene Association will hold its annual meeting October 11th to 13th in St. Louis. The Central States Pediatric Society, which also meets in St. Louis October 13th and 14th, will hold a joint session with the first mentioned association.

Death of Professor Politzer.—Professor Abame Politzer, the noted otologist of the University of Vienna, died on Thursday, August 12th, in his eighty-fifth year. Dr. Politzer was the teacher of many American postgraduate students in Vienna.

Archives of Surgery.—The first number of the *Archives of Surgery* has recently been issued by the American Medical Association. It will contain papers which have been read before the surgical section of the Association and also original articles pertaining to research and investigation in the field of surgery.

Award of Cameron Prize.—The Cameron prize of the University of Edinburgh has been awarded to Sir Robert Jones in recognition of the highly important advances he has made in orthopedics and his many valuable contributions to the literature of the subject during the past five years. The prize has not been awarded since 1915, when it was given to the late Sir Lauder Brunton.

French Asylum Transformed.—The National Asylum at Charenton, France, is to be gradually transformed to a giant maternity home and crèche. At present 500 mental patients occupy the asylum, which has accommodation for 1,500. These 500 will remain in one wing of the vast building, and as they die out—the mortality rate is high—their places will not be filled. From now on 1,000 beds will be reserved for the Institute of Puericulture, providing accommodation for about that number of recently confined women, who will stay there with their infants for an average of two months. The number of these occupants will gradually increase in proportion as the others disappear.

Personal.—Dr. John M. Finney, of Baltimore, has recently returned from Europe, where he attended the Interallied Surgical Congress at Paris.

Dr. V. J. Harding, associate professor of biological and physiological chemistry at McGill University, has been appointed professor of pathological chemistry in the University of Toronto.

Dr. W. Thurber Fales, of Malden, Mass., has been appointed instructor of biology and public health in the medical school of the Johns Hopkins University.

Dr. S. Burt Wolbach, professor of pathology and bacteriology at Harvard Medical School, has returned from Poland, where he spent six months studying typhus.

Dr. Sebastian Recasens, of Spain, is on a visit to this country for the purpose of studying radium treatment of malignant diseases.

Book Reviews

MARK TWAIN ANALYZED.

The Ordeal of Mark Twain. By VAN WYCK BROOKS, Author of *Letters and Leadership*, etc. New York: E. P. Dutton & Co. Pp. vii-267.

Two questions force themselves upon the reader of this book. How many countrymen of Mark Twain would subscribe to Brooks's conviction of the beloved writer's failure and recognize in him a pessimistic sense of defeat struggling with his naturally cheerful nature? This presses the second question: Who among us would be roused to conscientious self-examination to see if he too had fallen under the spell of public opinion to the detriment of creative ability? No thoughtful person can deny the realization of a manysidedness in the attitude of Mark Twain, the acknowledged humorist of the American people, which discloses traits that are not those of the satisfied man. When his life and work are closely studied it is discovered that his uncertainty of attitude is apparent not only in the latter years of life that suffered many external losses, not alone at times of financial collapse. It has been present in the man all through his personal career. It has made of the external griefs, of the losses and successes only episodes which represent the attitude with which the man took up his life and work. They are the results in large part at least of his confused position in regard to himself and the world about him.

There is something that puzzles the admirer of Mark Twain; something that detracts from the power that should be found in his work. One who had such ability to win the attention of a people, to hold and extend it into wider circles should have left many a stimulating message. There were times when Mark Twain stirred his readers to such expectation, there were writings which suggested that the contented would have to don their armor of protective convention. Those restless for advance almost found a leader in him but the promises were little fulfilled. Instead of this evidences of a hindering of his vast powers are found in his writings in his populace winning speeches in his business ventures in his successes as well as his conspicuous failures. His works reveal themselves for the most part as only a vast flood of effort to please to satisfy an uncritical public. The public to which he catered cared more for its fixed conventions under which it obtained its material success and maintained its established literary complacencies than to be roused to new development.

Brooks shows that this is largely the result of the period to which Mark Twain belonged, the era of a tremendous effort and a too engulfing type of success. Material standards were those of the nation and individuals bent themselves toward them. Mark Twain and his associates almost forgot the urgency of the creative instinct. They overlooked the fact that it represents the more urgent need of the individual as well as his chief avenue of service to society. But no; Mark Twain himself did not entirely forget. Again and again he gives evidence of this. In the reports of his

biographers as well as through the often uttered thought in his own writings, in his letters, wherever Mark Twain spoke, this man of such apparent success revealed the suffering of an impaired spirit. His testimony was constantly that of a house divided against itself, the house of his inner soul. "You observe that under a cheerful exterior I have got a spirit that is angry with me and gives me freely its contempt." This he writes to his mother. It is to her that Brooks points his readers to witness the heavy hand of pressure laid by this impressive woman upon the child soul. Brooks touches slightly upon the elements of libido fixation which led the boy to accept such a strong limitation by another person. He tells us of the mother's capacity for loving which her husband failed to satisfy. He mentions the sensitive boyhood oppressed by the boy knew not what sense of naughtiness and guilt. At any rate these things rendered him so impressionable, so heartbrokenly sensitive at his father's coffin that he permitted the signing of himself away to his mother's wishes. He subscribed to the fixed conventionality which she represented and stifled the freedom to create and to express according to the sincere dictates of his own nature. His later life throughout his varied career was a successive repetition of such acknowledgment of the force of convention. He submitted to the authority of money or of accepted literary taste. He was a life long victim of all sorts of worshipped standards. These failed to encourage, they actually forbade the launching of new thoughts. A soul inwardly aware of its own power could not permit itself the free expression of its convictions and send them forth as regenerating ideas.

Such are the secrets of Mark Twain's unrest with himself and of his failure in vigorous messages. His artist's spirit had been turned aside from its service to his own age and the future. He himself valued most that time in his life when in the position of river pilot on the Mississippi he stood above public opinion and was able for once to be himself. Here and there in his later life he tried to attain again this freer exercise of himself but it was with only partial success. He revealed a pathetically undue exaggeration of the furor that such possible free expression would produce about the heads of his descendants. Great he was, but his genius never dared find and exercise itself. Hence its flooding in many directions where it stood at a high water mark but never flowed on to wear new channels. He dared not upheave the calm exterior of society. Thus he could do little to ease the pain of a hindered life. He dared not attack the system of things and so he remained, Brooks says, "the playboy to the end, divided between rage and pity, cheerful in his self-contempt, an illusionist in the midst of his disillusion." In this he is the typical American unappreciative of the self-responsible soul of the artist. Thus Brooks arraigns America itself in this presentation of Mark Twain. The latter was partially just disturbingly

aware of his creative spirit. Too many of his fellow citizens are unaware of power and responsibility and to too great an extent this is true of American society in general. This well written study therefore of this national literary hero is a wholesome stimulus to sober selfconsideration and national testing, as regards the freedom of the creative spirit from without and from within.

ORAL SURGERY.

Oral Surgery. A Treatise on the Diseases, Injuries, and Malformations of the Mouth and Associated Parts. By TRUMAN W. BROPHY, M.D., D.D.S., LL.D., Sc.D., F.A.C.S., President, and Professor of Oral Surgery, Chicago College of Dental Surgery; Oral Surgeon to St. Joseph's, Michael Reese, and Other Chicago Hospitals; Consulting Oral Surgeon to the Presbyterian Hospital. With Special Chapters by MATTHEW H. CRYER, M.D.; G. HUDSON MAKUEN, M.D.; WILLIAM J. YOUNGER, M.D.; F. W. BELKNAP, M.D.; CALVIN S. CASE, M.D., D.D.S. With Nine Hundred and Nine Illustrations, Including Thirty-nine Plates in Colors. Philadelphia: P. Blakiston's Son & Co., 1918. Pp. xvi-1090.

The history of oral surgery as a specialized branch of medicine and as the first specialty of dentistry is comparatively short and dates back to the influence of James Edmund Garretson, who at the height of his career about seventy years ago commanded the attention of the world with his very important work in surgery of the mouth. Although the care in avoiding mutilation of the external features while performing intraoral operations emanates from Garretson there is today a great deal of mutilation produced by members of the medical profession, who find it a much simpler technic to lift away the cheek for the removal of the superior maxilla than to work through the natural opening.

Truman W. Brophy received his early training from Dr. Garretson, whose influence is immediately shown in the preface of his book when he says that the important principle to be observed is to operate so that the parts will be left in as nearly a normal anatomical condition as possible. That of course is an underlying principle of general surgery, but in no branch of the work is the execution of this principle as vital as in surgery of the mouth and the surrounding parts.

Most important in the crowded material of over 900 pages is the original contribution of Brophy's on the cleft palate. There are few more ugly conditions than the congenital condition of the harelip and cleft palate, regarding which there has been so little understanding. To definitely establish the truth about the cleft, which had long been regarded as a condition of atrophy, was the first move. "A cleft palate," says Dr. Brophy, "is a fissure, a separation of well developed parts, not the result of arrested development nor failure of the normal quantity of tissue to enter into its structure." Upon the recognition of that fact, Dr. Brophy attempted to bring the parts of the superior maxilla together under pressure. The complete success of the operation depends entirely upon the age of the patient at the time of operation, the first three months of life being the most favorable period. The operation today is generally used. It was for a long time

contended that speech, the mechanism of which is largely dependant upon the palate, would not be rectified, and that an obturator would have to be employed but time and the results of the operation have since disproved the belief of the skeptics. The technic of the operation with its many variations is carefully outlined and aided by the many photographic representations.

Much more can be said about the remaining material, the first part of which concerns itself with a consideration of the general conditions of surgery and the second half with those of the buccal cavity and the surrounding parts—material that Dr. Brophy began to collect in 1886 and which he did not publish until 1915, replete with data and photographic and diagrammatic representations to help the student and the practitioner to a better understanding of the subject. Since 1915 six editions of the book have been published; the seventh is now being issued.

MODERN ADVENTURE.

Hills of Han. By SAMUEL MERWIN. Illustrated. Indianapolis: The Bobbs-Merrill Company. Pp. i-365.

Mr. Merwin has done a thing which we have always maintained there was no reason for not doing—he has compounded a thrilling adventure story out of persons and situations which do not strain anyone's credulity. He has done even more, for there is some shrewd psychology in the depiction of his characters. It is, however, not a book which the missionaries will care to read, for one of its chief figures is a missionary, and one of its author's preoccupations is with showing how the rigor of a missionary compound denies fundamental human needs—joy, spontaneity, colorful expression.

This book is interesting as showing what can be done by a writer who does not actually shut his eyes and ears to what is going on in the world. As a tale of adventure *Hills of Han* is full of exciting incidents, mostly violent—the revolt of the Chinese against foreign capital, leading to attacks on all foreigners; the heroics of the rebel student Li Hsien; the creeping by night through mysterious dangers; the fighting about Ping Yang; the background of political intrigue, and the teeming life of the Orient. In addition, however, Mr. Merwin has given us several characters who denote struggle. There is Griggsby Doane who, after years of military faith as a missionary, finds that at forty-five he is full of energy and in the wrong work, and whose bitter struggle against doubt ends in his deciding to begin over again in a primitive, satisfying existence as a common workman. On the other hand there is Jonathan Brachey, the journalist who, embittered by an unhappy marriage, tries to solace himself with solitude and Nietzschean self sufficiency. He, too, finds after he has met Betty Doane, Griggsby's daughter, that he has to start afresh. There is Betty herself, an affectionate, impulsive, artistic temperament, among people who associate joy with vice. The psychological—and in one place physical—struggle between Doane and Brachey is quite as exciting as the shooting up of the missionaries.

One thing more Mr. Merwin has done. He has caught something of the ancient wisdom and the new turbulence of China; there is a rumbling pro-

phesy of the student revolt to come, of the beginnings in China of the class warfare that today is encircling the globe. A very modern adventurer, Mr. Merwin. He seems to have read Freud, and he probably has read something about the class struggle. So many writers of thrilling fiction refuse to know anything about either.

MYSTERY.

The Paradise Mystery. By J. S. FLETCHER. New York: Alfred A. Knopf, 1920. Pp. ix-306.

In these days, when a doctor can be condemned for culpable negligence or exonerated by a learned jury numbering the butcher, baker and artisan, it is refreshing to read of one accused of murdering a man, poisoning another and betraying a friend, calmly going on with his work with the hot breath of slander full on him, and his former associate unkindly running all over the country to prove him guilty. Certainly the poisoned man died of hydrocyanic acid poisoning; certainly the hero—Dr. Ransford—had given him some digestive pills, but he had died immediately, whereas a fellow practitioner explains that, as the pills were sugar coated, they could not take effect instantly. (Science usually appears as the guardian angel in mystery stories.) In the end an aged citizen who is highly esteemed is proved the murderer, but he is so angry with the treacherous associate, thinking he has betrayed him to the police that he shoots him dead and poisons himself—no sugar coating this time—leaving nothing for the police to do but rush away for Dr. Ransford to come and say the men are dead. Not a difficult task, nor was that of reinstating himself in the neighborhood's esteem any harder. The story is well told, because the mystery is kept up right to the end.

THE ORIENT.

Civilization. Tales of the Orient. By ELLEN N. LA MOTTE. New York: George H. Doran Company, 1919. Pp. 231.

Tuberculosis is an insidious, often an unrecognized disease, and many years of Miss La Motte's life were spent in directing national efforts to fight it, and the habit of thoughtful consideration of an evil cannot be suddenly broken nor small indications—negligible to the laity—be ignored. So it came about that when working in the French War hospitals, when traveling in Japan she saw, underneath the pomp and glory of war, underneath the picturesqueness of the East, much that was remediable especially in military camps and the evils of the opium trade, therefore much to be not only deplored, but exposed to the sterilizing light of publicity.

In the book giving tales of the Orient she is, in reality, attacking a morbid condition, which with grim sarcasm, she calls civilization. The stories she tells are good, not a few bare facts with scenery spread over to hold them together. *Canterbury Chimes* and *Homesick* are especially good, but the undertone in all asks What has civilization done to place the peoples of the Orient on a higher level and induce that sympathy and understanding too long withheld by the Western world?

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

THE LIFE OF ROBERT OWEN. By HIMSELF. With an Introduction by M. BEER, Author of *A History of British Socialism*. New York: Alfred A. Knopf, 1920. Pp. xiii-352.

GOTTFRIED KELLER. Psychoanalyse des Dichters Seiner Gestalten und Motive. Von Dr. EDUARD HITSCHMANN. Wien: Internationaler Psychoanalytischer Verlag, G. M. B. H., 1919. Pp. vii-125.

YOUTH AND EGOTATRY. By PIO BAROJA. Translated from the Spanish by JACOB S. FASSETT, JR., and FRANCES L. PHILLIPS. Edited, with Introduction, by H. L. MENCKEN. New York: Alfred A. Knopf, 1920. Pp. v-265.

COLUMBIA UNIVERSITY BULLETIN OF INFORMATION. Annual Report of the President and Treasurer to the Trustees with Accompanying Documents for the Year Ending, June 30, 1919. Illustrated. New York, 1920. Pp. v-499.

ELECTRIC IONIZATION. A Practical Introduction to Its Use in Medicine and Surgery. By A. R. FRIEL, M.A., M.D. (Dub.), F. R. C. S. I., Aural Specialist, Ministry of Pensions, London District, etc. Illustrated. New York: William Wood & Co., 1920. Pp. ix-78.

THE NEW PHYSIOLOGY IN SURGICAL AND GENERAL PRACTICE. By A. RENDLE SHORT, M.D., B.S., B.Sc. (Lond.), F. R. C. S. (Eng.); Examiner in Physiology for the F. R. C. S., etc. Fourth Edition, Revised and Enlarged. Illustrated. New York: William Wood & Co., 1920. Pp. xi-291.

DIAGNOSTISCHER LEITFADEN FÜR SEKRET-UND BLUTUNTERSUCHUNGEN. (Theoretisches und Praktisches.) Von Dr. C. S. ENGEL, Sanitätsrat, Arzt und Laboratoriumsleiter in Berlin. Mit 144 Abbildungen und 1 farbigen Tafel. Zweite, völlig umgearbeitete Auflage. Leipzig: Verlag von George Thieme, 1920. Pp. xv-303.

THE DUODENAL TUBE AND ITS POSSIBILITIES. By MAX EINHORN, M. D.; Professor of Medicine at the New York Postgraduate Medical School; Visiting Physician to the Lenox Hill Hospital, New York. Illustrated. Philadelphia and London: W. B. Saunders Company, 1920. Pp. xiii-122.

HEART TROUBLES: THEIR PREVENTION AND RELIEF. By LOUIS FAUGÈRES BISHOP, M.A., M.D., Sc.D., F.A.C.P., Professor of the Heart and Circulatory Diseases, Fordham University School of Medicine, New York; President of the Good Samaritan Dispensary; Physician to the Lincoln Hospital, etc. Illustrated. New York and London: Funk & Wagnalls Company, 1920. Pp. xvi-422.

AN INDEX OF SYMPTOMS. With Diagnostic Methods. By RALPH WINNINGTON LEFTWICH, M.C., Late Assistant Physician to the East London Children's Hospital; Author of *Tabular Diagnosis*, etc. Seventh Edition, Revised by H. N. WARNER COLLINS, B.Sc., M.R.C.S., L.R.C.P., Radiographer to the Putney and Chiswick Hospitals; Deputy Radiographer to the Evelina Hospital. New York: William Wood & Co., 1920. Pp. xii-595.

LEHRBUCH DER VOLKSERNÄHRUNG NACH DEM PIRQUET'SCHEN SYSTEM. BEARBEITET VON J. HEUSSLER, E. MAYERHOFER, FRAU R. MIARI, E. NOBEL, ER. OBERLEITNER, CL. PIRQUET, R. SCHNEEWEIS, R. WAGNER. Herausgegeben von Priv. Doz. Dr. E. Mayerhofer, Assistent der Universitäts-Kinderklinik; und Prof. Dr. C. Pirquet, Vorstand der Universitäts-Kinderklinik in Wien. Mit 32 Abbildungen im Texte. Wien und Berlin: Urban & Schwarzenberg, 1920. Pp. vi-299.

DEMENTIA PRAECOX AND PARAPHRENIA. By Professor EMIL KRAEPELIN, of Munich. Translated by R. MARY BARCLAY, M.A., M.B., from the Eighth German Edition of the *Textbook of Psychiatry*, vol. iii, Part II., section on the Endogenous Dementias. Edited by GEORGE M. ROBERTSON, M.D., F.R.C.P. (Edin.), Lecturer on Mental Diseases in the University of Edinburgh and Physician to the Royal Asylum, Morningside. Illustrated. Edinburgh: E. & S. Livingstone, 1919. Pp. x-331.

Practical Therapeutics and Preventive Medicine

A Compendium of Treatment and Prophylaxis, Original and Adapted

THE TREATMENT OF SURGICAL SHOCK.

By JOSEPH W. WALSH, M. S., M. D.,
Brooklyn, N. Y.

The condition of shock was known to the ancients, but the term shock was introduced in 1795 by James Latta to designate the condition following severe injury. Shock is really a general depression of the vital powers, the result of an injury or profound emotion. It may be slight or transient or severe and prolonged. It is usually sudden in onset, but may come on gradually, and possibly may produce almost instant death. There are many theories as to the cause and nature of shock, none of which is entirely satisfactory. I shall, however, discuss only its treatment.

There are various forms of shock and some cases call for special methods of treatment. We have apathetic shock, also delayed shock which comes on several hours after an injury or a violent emotional disturbance. This latter form is often seen in people who have passed through a railroad accident. It is often the sign of a concealed hemorrhage and is sometimes encountered after the administration of ether or chloroform. Erethistic or delirious shock is said to exist but I do not believe the condition is true shock, but rather a traumatic or toxic delirium added to or following shock. There are also shock from bullet wounds, shock in anesthesia, local shock peculiar to gunshot wounds, shock during operation, shell shock and war shock. The treatment in all these forms is not identical.

In treating ordinary apathetic shock, raise the feet and lower the head, unless cyanosis is caused by such position. The head should be lowered and the body recumbent, maintain body heat, wrap the patient in hot blankets, surround him with hot bottles, hot bricks or hot water bags; always have your bottle, bag or brick wrapped in some material such as flannel, to avoid burning the patient. Stimulants are of little value, when given by stomach. They are not absorbed. Normal salt solution should be infused into a vein, if the blood pressure is below eighty. If the blood pressure is higher give the solution by rectum or subcutaneously. Intravenous infusion is beneficial in hemorrhage. The infusion may be mixed with adrenalin chloride; one teaspoonful of the 1-1,000 solution of the adrenalin chlorid is added to one litre of the salt solution, one half to two pints being given at a temperature of 105° F. or over as it enters the vein. This degree of heat will not damage the corpuscles. If salt solution is given too rapidly or in too great a quantity it may gather in the chambers of the right heart and arrest a heart already weakened. It has been stated that the best way to use adrenalin in severe shock is by Crile's method, to introduce it into the arterial system and toward the heart. Occasionally resuscitation from apparent death may be

accomplished by this means. The technic by this method is as follows: Place the patient in the prone position. He is then subjected at once to rapid, rhythmic pressure upon the chest on each side of the sternum. This pressure produces artificial respiration and a moderate amount or degree of artificial circulation. A cannula is then inserted in the direction of the heart into an artery. Normal salt, Ringer's, or Lock's solution or in their absence sterile water or in the greatest extremity tap water is infused by means of a funnel and rubber tubing. As soon as the flow has begun, the rubber tubing near the cannula is pierced with the needle of the hypodermatic syringe with 1-1,000 adrenalin chloride solution and fifteen to thirty minims are injected. Repeat this injection in a minute if needed. Synchronously with the injection of the adrenalin the rhythmic pressure upon the thorax is increased. The result is an artificial circulation distributing the adrenalin. This causes a stimulating contact with the arteries, bringing a wave of powerful contractions and producing a rising arterial and consequently coronary pressure. When the coronary pressure rises to forty m. m. or more, the heart is likely to resume action. The first result of this action is to spread still further the blood pressure raising adrenalin causing a further rise in blood pressure. Such pressure favors tissue resuscitation especially of the central nervous system. When the heart beat is well established withdraw the cannula because there is no longer need for it. Unless there has been hemorrhage, the only reason for using saline infusion is to introduce adrenalin into the circulation toward the heart. Bandaging the abdomen and extremities tightly over masses of cotton is an excellent addition to this treatment. In prolonged shock and shock accompanied by hemorrhage, direct transfusion of blood is indicated. Hot and stimulating rectal enemata are important agents of treatment also. Enemata of hot coffee or hot normal salt solution are beneficial. In giving such enemata carry the tube as high as possible and inject so as to distend the colon. Another effective method of treatment is hypodermoclysis of normal salt solution into the cellular tissue of the loin, scapular region or under the breast after thorough disinfection of the point of injection with iodine. The syringe holding the salt solution being two or three feet above the bed, a pint or more of the solution will be absorbed in an hour's time. Strychnine, hypodermatically, is of doubtful value in collapse, in fact it may be harmful by increasing the heart action when the heart has not enough blood passing into it to enable it to contract firmly and strongly. Atropine is beneficial in shock, especially if the skin is moist. This drug acts upon the vasomotor system, combats vascular dilatation, maintains vascular tone, opposes blood stagnation and increases the amount

of moving blood. Senn recommended a hypodermic syringeful of sterile camphorated oil every fifteen minutes until reaction begins. Inhalation of oxygen frequently serves well and artificial respiration may be necessary.

Opiates are contraindicated in shock. Mustard plasters over the heart, spine and shins are used. A turpentine enema is useful. Pituitrin is valuable to restore blood pressure. Intramuscular pituitrin injections in ten to thirty minim doses or intravenously in saline solution are often given. In severe cases of shock bandage the extremities. Bandaging for the relief of shock is called auto-transfusion and causes an increased peripheral resistance, enabling the body to utilize to the best advantage the small amount of circulating blood, sending most of it to the brain, where it will activate the vital centres and maintain respiration and circulation. It is well to massage the abdomen also and drive out the blood imprisoned in the splanchnic area, after which a compress and binder are applied to prevent a quick return of the intraabdominal circulation. With very low blood pressure and continued bleeding immediate transfusion of blood is imperative. Artificial respiration and stimulation of the diaphragm may be used with good effect. When death without prompt operation is certain it is proper to operate during shock, the shock itself being treated vigorously by assistants not concerned in the operation.

Treat delayed shock as you do apathetic shock if hemorrhage, sepsis and fat embolism are excluded. If hemorrhage exists, arrest the bleeding and give a blood transfusion or a saline infusion into the vein, using adrenalin as in apathetic shock if the hemorrhage is firmly checked. In delirious shock due to sepsis the treatment is that of the sepsis or if due to uremia, the other most common cause for the so-called delirious shock, the treatment is the same as for uremia. Shock from bullet wounds may result from deeply concealed hemorrhages and calls for treatment.

Local shock from gunshot wounds relates to the devitalization of the tissues in the immediate vicinity of the wounds and the treatment of this condition is to rest in asepsis; it is further stated that "antiseptics will tend to maintain this state of lowered vitality and to favor microbic attack," (1). The hypertonic saline treatment, Sir Almroth Wright's method in gunshot wounds, has many advocates, while some consider it inefficient. For irrigation or immersion a five per cent. solution of sodium chloride, in extremely septic cases a ten per cent. solution is used and when the wound becomes clean normal salt solution is substituted. In a short time this is abandoned and the wound is then merely dressed with gauze moistened in normal saline solution. Free drainage and removal of foreign matter, destroyed tissue and blood clots are necessary. Shock in anesthesia is treated by diminishing the amount of the anesthetic. Atropine is given hypodermically, especially when there is a profuse perspiration. Hot saline by rectum, heat to the body and lowering the head of the bed are all important in treat-

ing shock of anesthesia. The syncope of this condition is caused by a sudden cerebral anemia and calls for lowering the head and giving a hypodermic injection of strychnine. In extreme syncope, more likely to occur from chloroform, suspend the anesthetic entirely, lower the head, open the mouth with a gag, catch the tongue and make rhythmic traction while an assistant is making slow artificial respiration. If no improvement is noted invert the patient completely, holding him by the legs, and continue artificial respiration by compressing the sternum (Nélaton). Atropine, ether or ammonia by hypodermic injection, also mustard to the heart and spine, and faradism to the phrenic nerve are recommended. Fresh air should be admitted into the room. In some cases of anesthetic poisoning direct massage of the heart has been successfully employed. This was first suggested by Schliff in 1874. Hysteria found in men at the front is called war hysteria or war shock. Many writers have called it shell shock, a wrong term because this implies a shock due to shell explosions, an incorrect idea. Yet an explosion may cause a ruptured ear drum and bleeding from the ear. From war shock or shell shock temporary conditions such as deafness, blindness, dumbness, convulsions, forms of paralysis, states not unlike cerebral concussion, symptoms of neuritis, zones of anesthesia, muscular contractures, delirium, mania, tremor and spinal conditions may arise. War shock or shell shock should be treated by a neurologist, not by a surgeon.

REFERENCE.

1. HULL, ALFRED J.: *Surgery of War*.
698 ST. MARKS AVENUE.

Early Surgical Intervention in Severe Sprain of the Knee.—Leriche and Santy (*Lyon médical*, April 25, 1920) maintain that in certain severe sprains of the knee, with some degree of dislocation due to complete tearing of the infrapatellar fibrofacial tissues or with loosening of the crucial ligaments, it is well to intervene surgically as soon as possible in order to repair the tissues before definite retraction has set in. In a recent case, arising through a tramway accident, there was complete dislocation and flaillike condition of the knee joint, together with contusion of the abdomen and injury to the scrotum. Two hours after the accident, the abdomen having been opened and found negative, and the scrotal wound excised and sutured, a U shaped arthrotomy of the knee was performed and a piece of contused skin of the size of the palm of the hand removed. The torn infrapatellar tendon was trimmed with scissors, and likewise a large tear in the lateral fascial tissues. The free, torn portions of the crucial ligaments, the loosened cartilages, and bone fragments from the tibia were removed, and the synovial membrane, capsule and infrapatellar tendon returned. Three days later a few additional sutures were placed in the tendons and the skin wound closed. The patient recovered with a firm knee joint, without dislocation. Ten weeks after operation the patient walked about.

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Original Communications

ON THE USE OF BENZYL BENZOATE IN SOME CIRCULATORY CONDITIONS.*

By D. I. MACHT, M. D.,
Baltimore, Md.

In a communication presented in February, 1918, before the Society for Experimental Biology and Medicine, I described my work on the relationship of the chemical structure of some opium alkaloids to their effect on smooth muscle and the discovery of a new therapeutic agent, benzyl benzoate, as a consequence thereof (1). I showed that the peculiar and interesting effects of the opium alkaloid, papaverin, on the tonus and contractions of smooth muscle must be ascribed to the benzyl portion of its molecule and that the same effects, pharmacological and therapeutic, can be produced by the use of a simple benzyl ester. A complete pharmacological and therapeutic study on the subject was published (2). The conditions in which the benzyl effect was anticipated to produce therapeutic results, and in which such results were actually obtained by subsequent clinical trials, were those exhibiting either excessive peristalsis or excessive spasm of plain muscle viscera. Among such conditions were mentioned the following: Excessive peristalsis and colic of the intestines, as, for instance, in diarrhea and dysentery; spasm or colic of ureteral muscle, or renal colic; spasmodic contractions of the gallbladder, or biliary colic; spasmodic contractions of the uterus, or uterine colic; spasmodic contractions of the urinary bladder; spastic constipation, due to powerful tonic contraction of the intestine; pylorospasm; bronchial spasm, and arterial spasm.

I am happy to state that during the two and a half or more years since the first announcement of this work, I have gathered a large amount of additional pharmacological and clinical data concerning benzyl benzoate and that all my original observations have been fully confirmed and the therapeutic results obtained have more than corroborated my most sanguine expectations. In the present paper I wish to call attention to a therapeutic use of benzyl benzoate which I have already described, but which is not so well known as yet to the general practitioner, namely, its employment in the treatment of certain circulatory conditions.

PHARMACOLOGICAL DATA

The action of benzyl benzoate on circulation has already been described. The most striking effect of the drug is exerted upon the vascular system. After injections of benzyl esters, a fall in blood pressure is noted which can be shown to be due to a peripheral vasodilatation, the fall being a result of the depressor action of the drug on the smooth muscle cells of the arterial walls. The effect on the vasomotor centre after ordinary doses is negligible and unimportant. The effect upon the heart itself, after small doses of benzyl benzoate, is negative; so that after injections of the drug there is a marked fall in blood pressure without any depressant effect upon the heart muscle itself. Such an action is well illustrated by the subjoined curve, which shows the effect of an intravenous injection of benzyl benzoate in the form of an emulsion in a dog (Fig. 1). It will be noted that while the pressure had fallen the respiration and the heart beat were not at all impaired. Furthermore, it is interesting to note the long duration of the fall in blood pressure, with the gradual recovery to normal. Even an injection of a small dose of epinephrine was not completely effective in bringing the pressure level back to normal. All that adrenalin did was to cause an immediate sharp rise in the blood pressure, which then fell again and only gradually rose to the original level as the benzyl effect wore out. Even toxic doses of benzyl benzoate have been found by me to produce little effect upon the heart, a fatal dose killing the animal through paralysis of the medulla, and not of the heart.

THERAPEUTIC INDICATIONS.

In view of the marked vasodilator properties of benzyl benzoate, a therapeutic application of the drug naturally suggested itself. The indication for its administration was obviously a spastic contraction of the arteries, or angiospasm; and the drug was given to patients exhibiting such a condition with very satisfactory results. I have collected a large number of data concerning the use of benzyl benzoate in cases of hypertension observed by myself and by many other physicians. The best results, of course, were obtained in cases of idiopathic or essential hypertension, or high blood pressure without demonstrable involvement of the kidneys. The drug, however, was found effective in cases of high blood pressure, irrespective of its etiology,

*From the Pharmacological Laboratory of the Johns Hopkins University.

wherever the arteries were not calcified and were anatomically capable of dilatation.

It was found that benzyl benzoate reduced both systolic and diastolic blood pressures. The following are a few illustrations of the clinical results obtained:

Patient, A. K., blood pressure on examination 212/132. After five days' administration blood pressure was 182/110.

Patient, I. L., blood pressure before, 210/130; after, 180/120.

Patient, M. S., blood pressure before, 194/110; after, 164/98.

Patient, H. M., blood pressure before, 230/120; after, 175/105.

Patient, A., blood pressure before, 315/160; after, 240/148.

Patient, B., blood pressure before, 194/100; after, 178/80.

Patient, C., blood pressure before, 170/98; after, 150/80.

Patient, D., blood pressure before, 212/132; after, 182/110.

Patient, E., blood pressure before, 225/200; after, 165/120.

Patient, R. L., blood pressure on examination 225/200; after administering twenty-five drops of a twenty per cent. solution of benzyl benzoate for two days, the blood pressure fell to 165/140, and by the end of the week it became 165/120; after two weeks the pressure in this patient was reduced to 160/98.

Patient, A. W., blood pressure on examination 220/114; after five days' treatment with benzyl benzoate, twenty per cent. solution, three times a day, the pressure fell to 165/100.

Patient, L. L., blood pressure on examination 194/100; after five days' treatment, 178/80.

COMMENT.

I have found few cases of high blood pressure in which that condition was not relieved, at least temporarily, by benzyl benzoate. Most of the cases treated with the drug were ambulant patients who attended to their daily occupations while taking the drug while all the other conditions were the same. The only difference being the taking of benzyl benzoate, the effect of the drug in reducing the blood pressure was indisputable. In most of the patients the reduction of the blood pressure was accompanied by an improvement in their general condition. Thus, patients who complained of precordial pain or oppression showed decided improvement in that respect.

The most convenient and effective form of administration of the drug was found by the author to be the one originally used in his earlier experiments. A twenty per cent. alcoholic solution of benzyl benzoate was administered by mouth, either in cold water or milk. The ordinary dose was found to be twenty or thirty drops of such a solution, taken three or four times a day. The administration of benzyl benzoate in the form of a solution was found to be especially useful because it allowed of a convenient reduction of the dose whenever desirable. I have found that after administering to a patient full doses of benzyl benzoate and obtaining a desirable therapeutic effect, the reduced pressure could be maintained by keeping a patient on very small doses of the drug, sometimes no more than five minims of the twenty per cent. solution.

The effect of benzyl benzoate on the blood pressure was demonstrable even in such cases in which nitrites failed to produce a vasodilatation. Thus, I have been able to reduce a high blood pressure in patients who have become habituated to nitroglycerin

and sodium nitrite. The onset of the benzyl effect, however, is not as rapid as in the case of nitrites, although sometimes the vasodilator effect was appreciable within thirty minutes. The duration of the benzyl effect, on the other hand, was much longer than that in the case of the nitrites, with the possible exception of erythrol tetranitrate. The blood pressure sometimes remained at a low level for several days after discontinuing the drug.

In my experience no toxic effects have been noted after administration of benzyl benzoate by mouth. The drug has been given to some patients repeatedly for periods of over a year or more, without producing any untoward symptoms. So far as I have been able to ascertain from examinations of urine

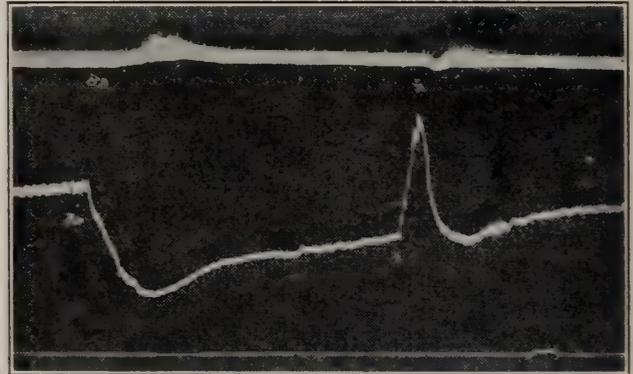


FIG. 1.—Dog, 8 Kilos. Paraldehyde anesthesia. Upper curve shows respiration; middle curve shows blood pressure; lower curve the time in five seconds. At BB, twenty mg. of benzyl benzoate in the form of an emulsion was injected into the femoral vein. At Ep, one mg. of epinephrine solution was injected. Note the fall in blood pressure and the lack of depression in the respiration and heart beat. Note also the prolonged duration of the benzyl effect on the blood pressure, with a gradual return to the normal level.

and functional tests of the kidneys, benzyl benzoate does no harm to the latter organs, and may therefore be administered, if desired, to patients suffering from nephritis.

As in the case of nitrites, however, I have noted, after observations extending over a period of more than two years, that patients will become habituated to benzyl benzoate and will not react as promptly to it as at the beginning of the treatment. Such patients, however, were generally of the nephritic type, whose condition was expected to become aggravated in the course of time.

While benzyl benzoate acts as a vasodilator and will therefore reduce excessively high blood pressure, the indications for its clinical use are precisely the same as for the use of other vasodilators, such as the nitrites. Its action is a purely symptomatic one, that is, in reducing the blood pressure. It is of course well known that a reduction of the blood pressure in many cases of renal disease and other conditions is not indicated and may even be harmful. In such cases, of course, benzyl benzoate is not to be used any more than nitroglycerin or sodium nitrite.

EFFECT ON CORONARY ARTERIES.

I have noted a beneficial effect following the use of benzyl benzoate in patients with hypertension who suffer more or less from precordial pain. I have also given the drug successfully in a few cases

of angina pectoris. If, as is generally supposed, anginal attacks are due to paroxysmal spasm of the coronary arteries, the favorable effects of benzyl benzoate may be explained by its vasodilator action on those vessels. Dr. A. B. Spach, of Chicago, collected a series of such cases, which is published elsewhere, and is of great interest. The pharmacological action of benzyl benzoate certainly warrants a more extensive trial of that drug in the treatment of this condition. The best method of employing it would seem to be to administer it between the acute anginal attacks. For the acute attacks the effect of benzyl benzoate by mouth would be too slow, and in order to relieve the patient it would either have to be given by subcutaneous injection in oil or, still better, the attack should be combated with a whiff of amyl nitrite.

SUMMARY.

Benzyl benzoate has been shown to be a powerful vasodilator, without being depressant to the heart when administered by mouth in small doses.

Owing to this property it has been found effective in the treatment of hypertension and angina pectoris.

The best method of administering the drug in such cases is in alcoholic solution, which admits of rapid absorption and a control of the dose.

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1. MACHT: *Proceedings Society Experimental Biology and Medicine*, xv, 63, 1918.
2. *Idem*: *Journal Pharmacology and Experimental Therapy*, xi, 389 and 419, 1918.

NEW THERAPY IN THE LIGHT OF NEW PHYSIOLOGY.

BY JOHN J. McNULTY, M. D.,
New York.

"Medicine needs a new physiology which will teach what health really means, and how it maintains itself under the ordinary varying conditions of environment. We also need a pathology which will teach how health tends to reassert itself under totally abnormal conditions, and a pharmacology which will teach us not merely the actions of drugs, but how drugs can be used rationally to aid the body in the maintenance and reestablishment of health. The new physiology, new pathology, and new pharmacology are growing up around us just now."—J. S. Haldane.

In clinical medicine we can be guided in our service by the larger, more inclusive vision. As helpful physicians we must consider the whole rather than the mere local aspect. If we are to serve in a social complex we must serve as those who have caught glimpses, at least, of a new biology, a new physiology, a new therapy. Let us hear and let us hold one thematic note, the note of the rhythm of the normal. Until we think the rhythm, hear the rhythm, see the rhythm of the normal we are unfit to enter into the presence of biology. The ineffectiveness of past therapy and much present therapy is the result of ignorant interference with Nature's law of maintenance and her law of repair. There is a beneficent, a helpful cooperation the physician can offer if he has caught a glimpse of Nature's law.

We are on the threshold of fuller revelation; a clearing away of the mist of false concepts. We seem to be ready for a higher understanding of that which appears ready to reveal itself; a vision of truer perspective. Man is too delicately adjusted in his physiology, in his interrelations and interdependencies of function, for the unskilled to meddle with this delicate adjustment. As we see more clearly the phenomenon of human life, we begin to perceive how wonderfully and fearfully this organism is made in its interrelated and interdependent functioning. Sensitive adjustment is a requisite of its continuance. The uninformed should not tamper with it.

It now appears as though the normal of physical man is dependent largely for its rhythm upon the functioning of the so-called autoprotective mechanism—the endocrine chain or cycle—an internal organism whose intelligence so transcendently surpasses our cerebral intelligence that it endeavors to protect itself against unskilled interference. This autoprotective mechanism stands only partly revealed, but now enough understood in its character and activities that we may approach it interrogatively and ask if we can aid in conditions of embarrassment.

Insufficiencies and sometimes deficiencies in this endocrine cycle seem to be a cause of modification of function and disorder of physiological rhythm. In this line of research there seems to be a real reason to feel that we can often come to Nature's aid through contributing from without substances like those which are insufficient or deficient. These substances—ductless gland substances—when administered, find their place of selection and by their presence, as catalysts, awaken, activate the inherent, the resident reaction. We have been so awkward, so clumsy in our use of endocrine substances in endocrine therapy, in thinking that gland substances owe their efficacy to volume and stimulation rather than understanding that internal secretions and enzymes aid only through the properties of vital catalysis to maintain a more normal "concentration and velocity of reaction."

A wonderful cycle of activities is the so-called endocrine system. The rhythm of the normal is delicately sensitive, notwithstanding a toxic environment. It is probable that the first deviation from the normal and its rhythm is due to a fatigue of the glandular system, especially the suprarenal glands—suprarenal fag; for the suprarenals seem to have most of the work to do in the autoprotective mechanism. We do not understand enough as yet of the endocrines to say which is the initiative, which is the receptive centre that receives and directs, but the suprarenal function seems to have no rest.

"Costa stated that nice distinctions between conditions due to various ductless gland disorders are very difficult to make. He does not attempt the differentiation suggested by Claude and Gougerot and others to determine in which gland the hypo-function (or hyperfunction) predominates, and which is essentially responsible for the disturbance. This undertaking appears to him much too difficult at present," states Luciani.

We are commencing to perceive enough of new physiology to know that the endocrines are vitally interrelated and interdependent in a unified function. With increasing knowledge of how the endocrines are interrelated and interdependent, we are not justified in a hazardous adventure of thinking we know, from obvious symptoms, which gland is primarily affected, and upon this evidence administer a seemingly indicated single gland substance.

Until our knowledge of the endocrines—their relations and reactions—becomes much clearer and more complete, we should administer small quantities of associated gland substances as they seem to be associated and act in the living human organism. Haldane stated: "A living organism differs in this respect from any mechanism which we can construct or conceive, that it forms itself and keeps itself in working order and activity." This is what new therapy should seek to do to aid an embarrassed living organism to form itself and keep itself in working order and activity. This is all the new therapist intelligently desires or attempts to do. We hope the old superficial and harmful interference with the living organism's selfworking is rapidly passing in the light of new physiology and new therapy. Again referring to Haldane: "Stated generally, therefore, the problem of physiology is not to obtain piecemeal physicochemical explanations of physiological processes, but to discover by observation and experiment the relation to one another of all the details of structure and activity in each organism as expressions of its nature as an organism.

"What is the practical object of medicine? It is to promote the maintenance and assist in the reestablishment of health. But what is health? Surely it is what is normal for an organism. By normal is meant, not what is the average, but what is the normal in the biological sense—the condition in which the organism is maintaining in integrity all the interconnected normals which . . . manifest themselves in both bodily structure and bodily activities."

In the light we now have to work in we can aid in the maintenance and assist in the reestablishment of health. The physician equipped with the new physiology and new therapy can abstain from stigmatizing his patient with incurable terms, for he knows with a clearer understanding that he can aid in the reestablishment of the normal, the normal with its rhythm. He can approach the embarrassed organism which manifests faulty functioning and, with a scientific understanding of qualitative and quantitative endocrine therapy, aid in the reform of conditions which have been considered incurable.

Endocrine therapy, and by endocrine therapy we mean associated gland substances, is not a wand we can credulously pass over the afflicted and say, Presto change. Associated gland therapy is a progressive, an improved effort to scientifically assist the organism manifesting weariness or even disease.

It is the holding of the physiologically normal in thought that protects us and our patients from errors in prognosis. The physician who today is serviceable in his socioprofessional relations is the practical physiological therapist who holds in thought the physiologically normal; the rhythm of the nor-

mal even in the face of the powerful influence of old pathological concepts. The physician who thinks and acts only in terms of pathology is today unacceptable. I have been approached by old patients who state that twenty years or more ago I was called to see them in uremic coma, that examination of the urine showed large hyaline casts, and still further informed that they had enjoyed twenty or more years of health with efficiency. I have answered that I hoped I would never again condemn with terms of fatality, for I now knew somewhat of Nature's law of repair; we should understandingly cooperate with this law of reestablishment. Most physicians desire and try to help but in their effort, guided by old therapy, they add embarrassment to embarrassment. New physiology and new therapy direct our desires and efforts more wisely, more serviceably, more reparably.

"But medicine, as we have seen, is supremely interested in the physiological normal. What a man sees at the bedside is a perversion of the normal, and Nature's attempts to restore it with what assistance medicine can give. For medicine it is necessary to know the normal in its elastic and active organization," states Haldane. "Old therapy is often so helpless. New therapy does not, like the old, seek to interfere but with a new understanding cooperates effectively with Nature in her law of return to the normal—to elastic and active organization.

Let us here state that if the full benefits of endocrine therapy are to be obtained the care of the entire organism must be considered. Rhythm of the normal; let us think it, see it, hear it and, as physicians, cooperate with it.

The time is now here when the intelligence of the so-called laity will not tolerate the physician who is only thinking in terms of pathology and its gruesome cortège of fatal terms. Society today needs the new physiologist, the new therapist who, to some working degree, understands the constant endeavor of the organism to maintain the normal rhythm. We find this reflected in Haldane: "My intellectual as well as my moral sympathies are all with the cheery general practitioner whose moral is 'Never say die.' and who flashes defiance at this dismal ghost."

". . . biological conception of organic regulation"—this is our theme, and this our desire. May we more fully understand it and more helpfully cooperate with it as general practitioners and as broadly equipped endocrinologists. "To whatever part of physiology one turns one finds evidence accumulating of the fineness and omnipresence of organic regulation." Let us work with this "fineness of organic regulation." "Treatment can only be securely founded on the correct and full diagnosis of what is amiss in organic regulation, and how nature can be aided in restoring this regulation."

The men who have blazed a trail in the wilderness of the unknown are those who have contributed the greatest blessings to afflicted humanity.

In endocrine therapy the temptation may come to see only the obvious, and treat only the obvious. This is the origin of monoglandular therapy. The one gland therapist does not understand that thyroid imbalance, hyperthyroidism or hypothyroidism, is rarely if ever a primary thyroid disorder. It may

be and usually is an objectification of suprarenal, or pituitary, or gonadal primary disorder or disease. This is why associated gland therapy is not only more scientific but more efficacious than single gland therapy. The law that the associated gland therapist works with is the organism's law of accurate, intelligent selection; selecting what is insufficient or deficient and appropriating it. Until our knowledge of physiology more clearly and perfectly approaches the intelligent selection of the autonomic mechanism, organic regulation, we should administer internal secretions and enzymes in associations, associated as they seem to be associated and act in the living human organism, confident that the resident intelligence will select needed supplies wisely.

I desire to quote here a paragraph from one of my former articles: Internal Secretions and Enzymes, Their Interrelation and Interdependence, Their Value and Application in Modern Therapy:

"Physiologically associated internal secretions and enzymes, endocrine therapy, has created a new therapeutic era. We can now treat disorders that we formerly and even recently called incurable, with greater confidence. No physician with present day understanding should allow a fatal prognosis to take possession of his thought nor should he voice a fatal prognosis. We now have sufficient understanding of a fixed and certain biological principle to apply it in curative therapy. The dawn is appearing over the domain of biological phenomena and we are beginning to understand their influences and utilize them beneficently. The old idea of the futility of treating so-called incurable diseases is rapidly giving place to definite and competent therapy based on successful issue."

We desire to quote the following from a recent article by Dr. S. W. Bandler:

"New things are always treated with scepticism, but each thinking physician may observe in his practice abundant material for research. By working together we may soon prove beyond doubt that while heredity shapes our ends there is an endocrinity that runs parallel."

New therapy based on new physiology is an improved therapy, a therapy that obtains results unlooked for in old methods of treatment.

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THE EARLY SIGNS OF TABES.

By BURTON PETER THOM, M. D.,
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With the exception of paresis, the most desperate symptom complex of which the spirochetal invasion of the nervous system is the cause, is tabes. Paresis is the same pathological manifestation as tabes only at a higher level; paresis involves the brain, whereas tabes involves the cord. It can therefore be asserted that every tabetic is a potential paretic. Until quite recently tabes could not be cured, its progress stayed or its symptoms mitigated except by the relief which opium affords. This was due to wrong

conceptions of its pathology but more especially to inadequate methods of treatment. But since the discovery of the *Spirochæta pallida*, the Wassermann reaction and the advent of salvarsan all this is changed and now this dread disease, like many others, if attacked in its earliest stages is amenable to treatment. For, if it cannot be cured as some still believe—I am not among the number—its morbid processes can at least be stopped and its victim saved from its impending terrors.

Unfortunately, however, most of those suffering with tabes when they resort to the neurologist or syphilologist have reached the stage when such help cannot be given or only to a slight degree. Of these, many, I regret to say, are so because of faulty or careless diagnosis. If a correct diagnosis had been made at the beginning this melancholy procession would not be, or perhaps I had better say, it would not be so long.

The proper time to treat tabes is before it starts. This may seem a paradox but no more so than the ancient saw that "an ounce of prevention is worth a pound of cure." The importance of this statement I cannot emphasize too strongly and I will give reasons why it cannot be denied. It is well known that the *Spirochæta pallida* in common with all trypanosomes has a decided predilection for nervous tissue; and further, this predilection is in evidence at the very commencement of its onslaught. The researches of Dreyfus, Leishman, Ravaut, Fordyce and many others present ample testimony of this. They have shown that the specific reaction of lues is present in the spinal fluid of from twenty to thirty-five per cent. of all the syphilitics examined by them in the first year of the disease. If we strike an average of the percentages noted by the various observers it can be assumed that fully one fourth of all syphilitics in the first year of the disease show an invasion of the cerebrospinal axis. This invasion is independent of any nervous lesion being manifest. Be this as it may, it cannot be denied that any individual with a positive Wassermann in the spinal fluid is perforce a candidate for nervous syphilis. We also know with equal certainty that in nothing like twenty to thirty-five per cent. of syphilitics cerebral or spinal syphilis develops. It must therefore follow that the major portion of the potential neural syphilitics either get well spontaneously or as the result of treatment. But it is also true that a definite percentage do not resolve in this manner and nervous lesions follow early or late. It is variously estimated that in from fifteen to twenty per cent. of syphilitics who acquire the disease tertiary symptoms develop. In approximately one third of these the nervous system is involved. Tabes is by far the most prevalent form.

Since we know that the seeds of the disease are sown many years before, it must follow if they are not allowed to grow, tabes, and for that matter, all other syphilitic nervous diseases, can in most instances be prevented. Knowing this no case of syphilis in the early cycle of its development should be pronounced cured until a lumbar puncture had been made and the spinal fluid found to be normal. This should be in addition to repeated negative findings in the blood. Should the spinal fluid be

positive, even if the blood is negative, which not infrequently happens, energetic intraspinal treatment should at once be instituted and kept up until the findings in the spinal fluid have returned normal. This procedure should admit of no exception if we are to insure our patients, as far as is humanly possible in our present state of knowledge, against the future raid of the spirochetæ upon the nervous system. If this were made an inflexible rule in every case of early syphilis, tabes as a disease entity would almost disappear, or at least be lowered to the irreducible minimum common to all preventable diseases.

I realize that it is not always possible to control every case of early syphilis in the manner just described. Also, the majority of tabetics do not present themselves until well marked symptoms are present. It is not my purpose here to discuss these cases but rather those in which the subjective and objective symptoms are just beginning and in which the element of doubt as to the diagnosis of the condition still exists in the mind of the physician. There are many such and if their malady is diagnosed correctly they would be spared much suffering. Tabes, like its congener, paresis, is an insidious disease. It is therefore most difficult to diagnose at the onset but it is at this period when the damage done is still slight that it offers the best—I may say the only—opportunity for arrest.

One of the first of the premonitory symptoms of tabes is impotence. Many times it is this loss of sexual power that causes the patient to first seek medical advice. This sexual decadence is never sudden. The patient usually states that he has been noticing a decrease of sexual power for a year or more. If it is found that in conjunction with the impotence the testicles are insensible to pain when compressed it is almost certain that it is due to beginning tabes.

Another early symptom of tabes is slowness in emptying the bladder. In many instances if the patient has ever had gonorrhœa he may consult the physician for what he thinks is a stricture. In these cases there is always a lack of sensibility of the bladder, which may contain a large amount of urine without the patient being at all aware of it. Should the urine show evidences of decomposition, which will be shown by its odor and appearance, a low grade of fever will almost invariably be present due to absorption and a possibly existing pyelonephritis.

According to Osler ten per cent. of all tabetics have the ocular form of the disease; that is amaurosis caused by atrophy of the optic nerve. Failing vision, therefore, which cannot be helped by glasses, or the gradual or sudden appearance of scotoma, central, homonymous or heteronymous, should always cause suspicion of beginning tabes. An ophthalmoscopic examination should be made at once to determine the presence of choked disc; although as Hughling Jackson observed long ago there may be considerable choking of the disc without impairment of vision. Choked disc is not always due to tabes, however; atrophy of the optic nerve from pressure due to a pachymeningitis in the vicinity of the optic chiasm, neuritis of the nerve, an embolism of the lenticulate artery or an aneurysm of the same, a thrombus of the central retinal vein,

or glaucoma must also be considered. Smallness of the pupils—spinal myosis—may precede the classic Argyll-Robertson pupils for a considerable period and this condition of the eyes should always arouse suspicion. Diplopia or double vision is sometimes encountered in early tabes, as well as the slow and painless development of paralysis of the external muscles of the eye. Moebius is of the opinion that these symptoms are as significant of tabes as the Argyll-Robertson pupil.

A symptom which is highly suggestive of beginning tabes is loss of bone conductivity as exemplified by Egger's test with the tuning fork. It is not infrequently the very first objective symptom of the disease. Sudden deafness, a condition which has been compared by Hermet with primary optic atrophy, is also a sign of beginning tabes. Sudden or gradual loss of hearing in a middle aged man where no other cause can be assigned should cause a suspicion of tabes.

The so-called lightning pains which are present in the early as well as the later stages of the disease are very often mistaken for rheumatism or sciatica. To treat them as such, as so often happens, is to lose much precious time. There are certain peculiarities about the pains of tabes which should give pause before they are lightly dismissed as due to sciatica or rheumatism. One is the intensity of the pains. The pains of rheumatic arthritis or sciatica cannot possibly compare with these agonizing flashes which come and go with the rapidity of lightning—hence their name. Rheumatic pains, if of the muscles, are diffuse and if of the joints, as they usually are, there is stiffness. There is no stiffness of the joints in incipient tabes. Sciatica is often extremely painful but the pain is constant, it does not come and go as in tabes. It may be so severe as to cause the patient to limp, but it is never as intense as the shooting pains of tabes. It follows a definite tract—the course of the sciatic nerve. The pains of tabes are not definite in so far as any particular nerve distribution is concerned. When they leave, the skin over where the pains have been is sore and tender to the touch for some time after. As pointed out by Strauss, spots of purpura not infrequently follow these attacks over where the pains have been. Sometimes there is a herpetiform eruption not unlike that observed in shingles.

Loss of the patellar reflex is one of the early signs of tabes. For many years it may be the only objective sign of the disease. With loss of the patellar reflex it will almost invariably be noted that the triceps reflex is also absent. In examining for loss of reflexes however, I desire to call the reader's attention to the fact that the first reflex to be lost is that of the tendo achillis—the ankle reflex. In determining the presence or absence of the reflexes, most examiners test the patella or knee reflex first and if it is present, in many instances the possibility of tabes is dismissed. This is wrong. The first reflex to be tested should be that which is the first to disappear and that is the ankle reflex. This reflex is determined by placing the patient in a kneeling position and lightly tapping the Achilles tendon.

The so-called crises, gastric, vesical or laryngeal,

are sometimes present in the beginning of the disease. Usually, however, they do not occur until it is well established and the diagnosis is certain. A sudden attack of indigestion, especially if the patient complains of a peculiar feeling of weight in the epigastrium, or a sudden attack of diarrhea where there has been in neither instance no dietary indiscretion and which persists for several days should always cause tabes to be considered.

Perforating ulcers of the soles of the feet are usually late manifestations of the disease but occasionally they occur as a premonitory sign. I can recall a case in which this condition was present for a number of years before ataxia developed. The same is true of the so-called Charcot's joint—usually a late sign but sometimes appearing early.

A feature of tabes not often mentioned in the textbooks is the frequent presence of cardiac lesions, although attention was called to this thirty years ago by Strümpell. All forms of cardiopathies are to be noted but it would seem that aortic lesions predominate. This is not strange, however, when we consider that aortic disease is almost invariably caused by syphilis. So frequently are cardiac lesions coexistent with tabes that their presence where rheumatism or endocarditis can be excluded should always cause a search for the incipient signs of tabes.

Any individual in whom tabes is suspected should have a Wassermann test of the blood and of the spinal fluid. A cell count and the globulin reaction and the reducing power for Fehling's solution should also be ascertained of the spinal fluid. The colloidal gold test to show the tabetic curve can, in my opinion, be ignored. If present, it of course helps to confirm the other findings. These two examinations should be made even if there is no history of syphilis. For, as every syphilologist well knows, the disease may be present in the blood and spinal fluid and yet be otherwise asymptomatic. The absence of scars due to gross external lesions should not deter the examiner, for in the majority of instances they are not present. Should the blood be returned negative it does not by any means follow that the physician's suspicions are incorrect. It has been said that one swallow does not make a summer, neither does a single negative Wassermann reaction preclude syphilis. The blood is not infrequently negative in tabes and yet the disease may be present. Several tests should be made and if a doubt still exists a provocative salvarsan injection should be given and the blood tested repeatedly thereafter for at least ten days.

The cytological findings, however, are by far the most important. For, while syphilis may not be manifest serologically it will invariably give indications of its presence in the spinal fluid. I desire to emphasize this because it has been asserted and is quite generally believed that the Wassermann is negative in approximately fifty per cent. of tabetic spinal fluids. In spite of its wide circulation this statement in my opinion is incorrect. The reason for this seemingly large number of negative findings in tabes is due to the fact that too small an amount of fluid is used in making the test. If instead of two tenths c. c. of fluid, three or four c. c. were used the Wassermann would be found positive as

often as in paresis, i. e., one hundred per cent. The cell count in early tabes is always increased which is indicative of a more or less acute process. It is only when the disease is in a state of arrest or has progressed so far that the nerve tracts are completely destroyed that the cell count sinks to normal or nearly so, that is to ten or twelve cells to the counting chamber. The fluid also usually flows out under pressure. The globulin index is increased and there is reduction of Fehling's solution.

It is not my purpose here to discuss the treatment of tabes in this early stage. I believe treatment—salvarsan intravenously and intraspinaly—will arrest and in not a few instances cure the disease at this stage. One thing at least is certain; this early stage is the only stage where treatment offers such a hope. It is the patient's hour of fate—his only opportunity, and it is the duty of his physician to grasp it boldly and try to save him from what means eventually, as expressed by Heine, a "mattress grave."

1632 AVENUE A.

ADMINISTRATION OF SALVARSAN BY RECTUM IN THE FORM OF ENTEROCLYSIS.*

Preliminary Report.

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During my service in the venereal wards of the Philadelphia General Hospital under Dr. Siter and Dr. Alexander Randall, I had occasion to treat syphilitic patients who for various reasons could not be given salvarsan intravenously. It was essential that they receive it in some way or other as mercury and the iodides were inadequate. Realizing that they would be benefited by it if they could get it I decided to find some way. Textbooks and journals were searched for other methods, but those given did not seem satisfactory and uniformly safe.

In Warbasse's *Surgery* there appears the following statement: "The patient comes to the operation empty, hungry, and thirsty. The patient lies on his right side; an adult is given morphine, a child paregoric." With this as a nucleus salvarsan by enteroclysis was begun.

Following the basic principles that the patient should be empty, thirsty, and hungry, the patient was made empty and hungry by starvation and purgation and thirsty by withholding liquids and giving a few doses of atropine. In a series of fifty cases the following routine was followed:

If the administration was to take place at 1:30 p. m. the patient was given a very light supper, one fluid ounce of a saturated solution of magnesium sulphate and one or two compound cathartic pills at 5 or 6 p. m. of the preceding day. The next morning they were denied the regular breakfast but were given two cups of black coffee and one piece of soft toast. At 7 a. m. they received 1/150 gr.

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of atropine, at 10 a. m. another, and went to bed where they remained until that evening or next morning. At 1 p. m. they were given one quarter grain of morphine and 1/150 grain atropine hypodermically. During the entire day they were denied liquids, except in some instances a half glass of milk at noon. At 1 p. m. a "1-2-3" enema was given, consisting of magnesium sulphate one ounce, glycerine two ounces and hot water. By this time the condition of the patient was such that the absorption of the enteroclysis by a dried up bowel was an easy matter,—this is what we wished to accomplish. At 1:30 p. m. the enteroclysis was given and continued at a rate of forty-five to fifty-five drops a minute.

The solutions used varied according to whether salvarsan or arsenobenzol, neosalvarsan or neoarsenobenzol was given. If arsenobenzol was used it was prepared as usual and diluted with hot normal saline to 260-320 c. c. and the enteroclysis bag kept hot by hot water bags or electrical appliances. The neoarsenobenzol was dissolved in sixty c. c. of water at room temperature and diluted to 200-260 c. c. with normal saline and required no heat. As stated, the rate of flow ran from forty-five to fifty-five drops a minute and generally required one and a half to two hours. At first the patients were not al-

Dilution used	200 c. c.		230 c. c.		260 c. c.	
	hours	minutes	hours	minutes	hours	minutes
40 gtt. per min..	1	15	1	27	1	38
42 gtt. per min..	1	11	1	22	1	33
45 gtt. per min..	1	7	1	17	1	27
47 gtt. per min..	1	4	1	14	1	23
50 gtt. per min..	1	0	1	9	1	18
52 gtt. per min..	0	58	1	7	1	15
55 gtt. per min..	0	55	1	3	1	10

lowed to eat any supper that night, but later it was found that some could eat a light lunch and experience no after effects; those who could not went without food. That night they were allowed a few liquids and the following morning they resumed ordinary conditions and diet.

The untoward effects have been negligible and only once has anything unusual occurred, except now and then slight headache. If the patient cheats on the fasting she is likely to have nausea, perhaps vomiting and headache. One patient was given the enteroclysis with only a preliminary enema and morphine and atropine. That night she experienced pain across the abdomen, diarrhea, painful defecation and nausea. Bismuth, opium, plenty of water, rest in bed and liquid diet with several enemata benefitted the patient. There were no later manifestations. Another patient complained of dizziness, and a silly feeling which were traced out as an idiosyncrasy to atropine and morphine.

The dose varies between 0.6 gram and 0.9 gram. Nearly all were started with 0.6 gram of arsenobenzol for the first one, two or three doses, which was increased to 0.9 gram as the treatment progressed. With neoarsenobenzol 0.9 gram was given for four or five doses and then 1.0 gram. Of course it is not presumed that salvarsan by this method is any more beneficial than when administered in other ways and mercury and iodides are to be used in exactly the same way as in treating syphilis by the intravenous injections of salvarsan.

Indications for rectal administration are as follows:

1. Fat patients with small or no visible superficial veins.
2. Scrawny patients with poor veins.
3. Children.
4. Women for whom needlemarks in the arm would prove inconvenient in evening dress.
5. Patients with knotted veins from previous intravenous injections.
6. Hysterical and highly nervous types of patients.

REMARKS.

1. It is thought that by this method the solution is picked up by the blood vessels and lymphatics of the rectum and sigmoid and the greater proportion of the solution conveyed directly to the liver whence it is meted out, and that much more salvarsan enters the liver and is stored there by this method than by the intravenous method.

2. It has been questioned whether atropine should be used. The method, however, has proved successful in the presence of atropine, the drug which the researches of Novi have proved to be of greatest avail in the prophylaxis of nitritoid shock.

3. Morphine tends to quiet the patient and put him in a mental and physical state of acquiescence. This is especially helpful in the case of excitable and hysterical women, in whom an extra injection of morphine is frequently indicated.

4. The saturated solution of magnesium sulphate given by mouth has a hydragogue action, and desiccates the patient as well as cleansing out the gastrointestinal tract.

5. Any preparation of arspenamine or neoarsphenamine lends itself readily to this method of administration. In our hands, however, the neoarsphenamine has given the better results. It is less toxic and far less troublesome to prepare and administer.

6. More concentrated solutions might be used, but the above dilution has proved entirely satisfactory.

7. Critics prejudiced in favor of the intravenous administration of these drugs have raised the objection that much of the dose might be ejected by defecation. They fail to taken into consideration the fact that owing to the large doses of atropine and morphine given, with the resulting bowel atony and inhibition of peristalsis, there will be no bowel movement for many hours. During this interval

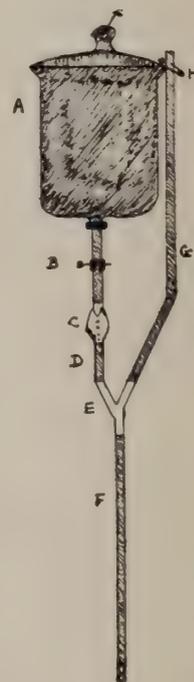


FIG. 1.—A. Hot water bottle or glass container. B. Dropcock. C. Murphy dropper. E. Glass Y. F. 20 French rubber catheter. G. Gas pressure release. H. Safety pin.

Dr. Morrison's apparatus for enteroclysis. (Modified by the Author.)

When no escape tube is used, gas forming can find no outlet owing to the construction of the single tube by the dropcock. The rectal catheter is therefore expelled by the intrarectal pressure. The same is prone to occur if the rate of flow is too fast and no adequate bypass is provided. This difficulty is entirely obviated by the use of the glass Y and escape tube featured in the above diagram.

ample time is afforded for the slow and complete absorption of all the drug administered. On the other hand, it is well known that a fair proportion of the dose of these drugs administered intravenously is excreted during the first few hours by the kidneys. As yet there has been no time for the laboratory study of the excretions after the administration of salvarsan by rectum. But it would seem that by this method the kidney waste should be reduced. For, when a given dose of arsenobenzol is injected directly into the blood stream the concentration in the blood rises immediately to above its kidney threshold value, and is only reduced to below this value after the liver has had time to effect a balance between storage and circulation. Meanwhile much of the drug has been lost by the kidney excretion. In injections by rectum absorption is slow, and the absorbed product passes directly to the liver, so that the latter is probably able to effect the balance between the storage and circulation before the concentration of the drug in the blood ever reaches the kidney threshold. For this reason the kidney threshold is probably never exceeded in the blood and none of the drug is lost in the urine.

CONCLUSION.

Inasmuch as we have been able to clear up or modify the secondary stages of syphilis and the reaction of the patients' blood to the Wassermann test by the rectal administration of salvarsan in the form of enteroclysis, without the use of mercury or iodides, we believe this to be a satisfactory method for its administration to those who are in need of it and who cannot receive it intravenously.

SEVEN GENERATIONS OF PHYSICIANS.

BY GEORGE SCHUYLER BANGERT, Ph. G., M. D.,
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An interesting family leaning towards medicine is shown in the Shippen family. In the first generation appears the name of Edward Shippen, M. A., M. D., the son of Rev. Robert Shippen, B. A., M. A., D. D., and a nephew of Edward Shippen (first mayor of Philadelphia), and a brother of Downright William Shippen, B. A., LL. B., M. P., and a brother of Rev. Robert Shippen, B. A., M. A., D. D. (vice chancellor of Oxford). He was born in Methley, England, in 1671 and married Frances Leigh, daughter of Peter Leigh of Lynne. He received his degrees from Brasenose College, Oxford, and subsequently succeeded his brother Robert as professor of music at Gresham College. He was also a physician.

In the second generation we find the name of Dr. William Shippen, Sr. (member of Continental Congress). He was the son of Joseph Shippen and Abigail Gross, and a grandson of Edward Shippen (first mayor of Philadelphia). (There is an India ink sketch of him by Mrs. Frances B. Pierce in the possession of the Pennsylvania Historical Society, Philadelphia, together with an etching of the same by Albert Rosenthal, 1884.) He was born in Phila-

delphia October 1, 1712. He applied himself early in life to the study of medicine for which he had a remarkable genius, possessing that instinctive knowledge of diseases which cannot be acquired from books. He seems to have inherited his father's eager desire to explore the domains of physical science and no doubt the Junto (American Philosophical Society) had its influence in shaping his course in life. It is not known what university granted him his M. D., but it is thought that he received his early training under one of the Welsh *Chirurgeons* who were brought to this country by William Penn. He received his literary education and medical instruction in Philadelphia where he studied with Dr. Cadwalader and under Dr. John Kearsley, Jr. He was a colleague of Dr. Zachary. Upon Dr. Cadwalader's return from Europe, 1730, he made dissections and demonstrations for the instruction of Dr. William Shippen, Sr. These instructions were given in the building where the bank of Pennsylvania stood in 1809. In 1903 the United States bonded warehouse was built there. It is on the west side of Second Street above Walnut Street.

Dr. Shippen is recorded as being, besides a physician, a chemist and an apothecary. (1) He speedily obtained a large and lucrative practice which he maintained throughout a long and respected life. He was especially liberal towards the poor and not only gave his professional aid and medicines without charge but often assisted with donations from his purse. He was very successful in his practice but did not by any means think that medicine was advanced to perfection. It is said when he was congratulated by someone on the number of cures he effected and the few patients he lost, he said, "My friends, nature does a great deal and the grave covers up our mistakes." Because he was conscious of the deficiencies of medical education in America and was animated by a patient desire to remedy them Dr. Shippen trained his son William, Jr., and sent him to the University of Edinburgh, where he had every opportunity to obtain a knowledge of the various branches of medicine. On his return, May 1678, he commenced a series of lectures on anatomy in one of the large rooms of the State House and thus was begun the first medical school in America (University of Pennsylvania). Dr. William Shippen, Sr., was not much interested in politics but at the close of 1778 when the outlook for the Americans was very dark he was called upon to take part in the convention of the nation. On November 16, 1778 (2) he was elected to the Continental Congress by the Assembly of Pennsylvania by a vote of twenty-seven. He was elected to a second term November 13, 1779. Throughout both terms he was constant in his attendance (3). His advanced years and his professional duties would have furnished ample excuse to a less patriotic citizen for declining the thankless position. Dr. Shippen was always at his post and his vote was that of an honest, intelligent, highminded, patriotic gentleman who thought always of his country's welfare. Dr. Shippen took an earnest part in the Junto from which probably sprang the American Philosophical Society. He was elected to this society, November, 1767, and was

made vice-president 1768-9, and was a member for many years. He was elected physician to the Pennsylvania Hospital for twenty-five years from 1753-1778. He was one of the five prominent physicians serving on the board of trustees from 1755-79.

He was also one of the trustees of the Academy in 1749. He helped found the Second Presbyterian Church of Philadelphia, 1742, and was a member of it for nearly sixty years. He was one of the founders and for thirty years a trustee of the College of New Jersey (Princeton). (One of the stained windows at that University contains the Shippen coat of arms.) He possessed a powerful frame and vigorous health for which his race was noted. At the age of ninety he rode horseback from Germantown to Philadelphia in the coldest weather without an overcoat; and but a short time before his death he took a walk of six miles from Germantown to his son's house in Philadelphia. His mode of living was simple and unostentatious. His temperament was so very serene and forbearing that tradition says: "It was never ruffled." His benevolence was without stint.

He was married in Philadelphia, September 19, 1735, to Susanna Harrison, the eldest daughter of Joseph Harrison and Catherine Noble of Philadelphia. She was the granddaughter of John Harrison and his wife, Mary. Dr. Shippen lived beloved and on November 4, 1801, in Germantown, Pa., at the age of ninety bowed his head, regretted and lamented, and was buried in the graveyard of the church to which he had been so useful in Philadelphia. His summer home which he built in Oxford Furnace, N. J., about 1742, is still standing well preserved. Dr. Shippen owned 10,000 acres of land in what is now Sussex and Warren counties, N. J.

In the third generation we find two brothers, both sons of Dr. William Shippen, Sr., and Susanna Harrison, i. e., Dr. William Shippen, Jr., and Dr. John Shippen. Dr. John Shippen, A. B., A. M., M. D., was born in Philadelphia, Pa., January 23, 1740. He was a graduate of the College of New Jersey, 1758; studied with his father and at the Medical Department of the University of Rheims, France. He received the degree of M. D. there. On his return to America, April 5, 1770, he began a course of lectures on fossils. He died unmarried in Baltimore, Md., November 26, 1770. Dr. William Shippen, Jr., B. A., M. A., M. D., the father of scholastic medicine in America, was surgeon general of the United States during the Revolution and the first professor of anatomy in America and the founder of the first medical school in America, i. e., the University of Pennsylvania.

Dr. William Shippen, Jr., was born in Philadelphia December 21, 1736, and died in Germantown, Pa., July 11, 1808. He was married in London, England, to Alice Lee of Virginia, daughter of Col. Thomas Lee, Governor of Virginia. Dr. Shippen was one of the founders of the first medical school in America, the University of Pennsylvania. He delivered the first course of lectures in America on anatomy November 16, 1762, and was mobbed by the public when he first introduced dissection. He continued to lecture on anatomy and obstetrics until

December 23, 1765. He was elected professor of anatomy and surgery in the Medical School College of Philadelphia, September 23, 1765. He was chief physician of the Flying Camp during the Revolution. He laid before Congress a plan for the organization of the Medical Department which with some modifications was adopted. On April 11, 1777, he was unanimously elected director general of all the military hospitals of the United States army.

He was president of the University of Pennsylvania, Medical Department, from 1805 until his death. He was a graduate of the College of New Jersey and valedictorian of the class of 1754. From that institution he received the degrees A. B., M. A. and received his M. D. from the University of Edinburgh, class 1761. He studied under Senac, John Hunter, McKenzie, and Smellie. After studying in Europe he returned to America, 1762. He was a member of the American Philosophical Society, also one of the first physicians appointed to the Philadelphia Hospital. A eulogy on Dr. Shippen was delivered by request by C. Wistar as an introductory lecture to the medical class in the autumn of 1808 (Portfolio Third Series, Vol. 1, No. 2, February, 1813). He was noted for his graceful personality, polite manners, power of conversation, sociability, conciliatory nature.

He reviewed a lecture not by interrogation but by recapitulation. His portrait by Gilbert Stuart is in Corcoran Art Gallery, Washington, D. C., one in Independence Hall, Philadelphia, one at the University of Pennsylvania and one at the Pennsylvania Historical Society.

In the fourth generation we find Edward Shippen, A. B., M. D., a son of the Chief Justice, Edward Shippen, and Margaret Francis, and a brother of Peggy Shippen, who married Major General Arnold while an officer in the American army. Dr. Shippen was born in Philadelphia, December 11, 1758, and died in Burlington, N. J., October 22, 1809. He married Elizabeth Julianna Footman, November 23, 1785, at Christ Church, Philadelphia. He studied medicine at Edinburgh and afterwards took a course in London and Paris. He removed to Burlington, N. J., in 1795, after having studied under Dr. Bond. In Burlington he became the partner of Dr. McIlvain, his brother-in-law. He was a man of agreeable, hearty manner and fond of horses. He had an excellent practice. A picture of him taken in London shows him as a student, a handsome youth, with powdered hair, lilac colored coat, gold waistcoat.

Also in the fourth generation we find his first cousin, Joseph Galloway Shippen, M. D., who was the son of Col. Joseph Shippen, A. B., and Jane Galloway. He was born in Plumley, Pa., December 25, 1783, and died September 6, 1857. He married Ann Martha Buckley, November 10, 1814, daughter of Daniel and Sarah (Brooke) Buckley. He graduated from the University of Pennsylvania with the degree of M. D. and was a practicing physician.

In the fifth generation is the name of Joseph Shippen, M. D., who was a son of Dr. Joseph Galloway Shippen and Ann Maria Buckley. Also

in this generation was William Shippen, A. B., M. D., who was a son of Thomas Lee Shippen and Elizabeth Carter Farley Bannister and a grandson of Dr. William Shippen, Jr. He was born in Farley, Pa., January 29, 1792, and was married in Petersburg, Va., February 13, 1817, to Mary Louise Shore, daughter of Thomas and Jane Gray (Wall) Shore of Violet Bank, Va. Dr. Shippen was vice president of the Pennsylvania Historical Society, trustee of the College of New Jersey (1841-1867), graduate of the University of Pennsylvania, M. D., 1814. He studied medicine under Dr. Wistar. He was a demonstrator of anatomy in the university. He died in Philadelphia, June 5, 1867.

In the sixth generation are two of the same name. The first, Edward Shippen, A. B., A. M., M. D., United States Army, was a son of William Shippen, M. D., and Mary Louise Shore. He was born in Farley, Pa., June 23, 1827. He was a graduate of the University of Pennsylvania, class of 1846, and received his M. D. with the class of 1857. He married Rebecca Lloyd (Nicholson) Post, the granddaughter of Judge Hooper Nicholson and Rebecca Lloyd, December 3, 1878. Dr. Shippen was a distinguished surgeon during the Civil war and among other services had charge of the Capitol at Washington, D. C., when it was used as a hospital. He had 1,000 wounded men under his care. Later he was with General Griffin as surgeon in chief of the Fifth Army corps, and then as medical director of the Twenty-third Army corps under General Scofield where he remained during the rest of the war. He died April 22, 1895, in Baltimore, Md.

The second name in the sixth generation is that of Edward Shippen, A. B., A. M., M. D. (rear admiral United States Navy). He was a son of Richard Footman Shippen and Ann Elizabeth Farmer. He was a grandson of Dr. Edward Shippen of the fourth generation. He was born at Singletree, Bordentown, N. J., June 18, 1826, and died at Chestnut Hill, Pa., June 16, 1911. He graduated from Princeton in 1845 and the University of Pennsylvania in 1848. He entered the United States Navy from Pennsylvania as assistant surgeon, August 7, 1849, was made surgeon, April 26, 1861, and sent to the coast of China and Africa and South America and on the European station for four years. He was on the *Congress* when she was destroyed by the *Merrimac* at Newport News, Va., March 8, 1862, and was injured by a shell. He was on the ironclad *New Ironsides* in both the attacks on Fort Fisher and the operation of Bermuda Hundred. He made a Russian cruise under Admiral Farragut, 1870-1. He was chief surgeon at the Naval Academy, Annapolis, Md., and medical inspector in 1871; fleet surgeon of the European Squadron, 1871-3; medical director at the Naval Asylum, 1876; president of the Medical Examining Board of Philadelphia, 1880-2, and for nearly seven years in charge of the Naval Hospital at Philadelphia. He was a writer on medical topics. He was retired in 1888 and in 1907 made rear admiral on the retired list. He was a Fellow of the College of Physicians and Surgeons of Philadelphia; president of the Pennsylvania Genealogical Society;

member of the Pennsylvania Historical Society; commander of the Military Order of the Loyal Legion, Deputy Governor of the Society of Colonial Wars of Pennsylvania; one of the vice presidents of the University Club. He married Mary Catherine Paul on January 13, 1853, daughter of Dr. John Rodman Paul and Elizabeth Duffield Neill of Philadelphia. She was born in Philadelphia, July 23, 1829, and died there January 18, 1905.

In the seventh generation we find three names of men who are first cousins, i. e., Lloyd Parker Shippen, M. D., U. S. N., M. R. C., who is the son of Edward Shippen and Rebecca Lloyd Post. He married Florence Hawley Brush. He graduated from the University of Pennsylvania (1907) and is a member of the Pennsylvania Commandery of the Military Order of the Loyal Legion. Charles Carroll Shippen, M. D., A. B., was the son of William Shippen, A. B., A. M., LL. B., and Achsah Ridgley Carroll. He was born in Philadelphia, Pa., October 29, 1856, and died in Baltimore, Md., November, 1905 (unmarried). He graduated from the University of Maryland in 1879. William Shippen, M. D., U. S. A., son of Thomas Lee Shippen and Jane Gray Gilliam, and grandson of Dr. John Gilliam, was born in Arrowfield, Va., May 21, 1861, and died (unmarried) November 17, 1913, at his home in Petersburg, W. Va. He served twenty years in the United States army as a surgeon.

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THE SCHICK TEST, ITS CONTROL, AND ACTIVE IMMUNIZATION AGAINST DIPHTHERIA.

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I shall endeavor to give a brief outline of the salient features of the Schick test and active immunization against diphtheria. The summary presents a working knowledge of the test and immunization, as practised in the Stuyvesant Branch of the Department of Health. Personal observations from the work carried on in the Stuyvesant Branch Clinic are noted in full. This article should be of particular value to the physicians of the Department, who are doing the Schick test for the Department's patients, and, secondarily, to physicians desiring a concise description of the test and immunization.

The Schick test is a practical and reliable test by which the antitoxic immunity of a person against diphtheria can be determined. The immunization is for the purpose of protection against diphtheria. In the progress of modern medicine the Schick test and active immunization against diphtheria occupy a most prominent and important place. In the determination of the antitoxic immunity of a person against diphtheria the Schick

test is as reliable a diagnostic aid as the Widal is in typhoid fever, or as the Wassermann is in lues. When we realize the prevalence of diphtheria among children, and the high degree of mortality we will appreciate the importance of the Schick test and active immunization in the prophylaxis and final eradication of diphtheria. Since the ages of one to five years is the period in which children are most susceptible to diphtheria and the mortality greatest, the necessity of the application of the test and active immunization early in the child's life, before the age of eighteen months, so that the child may be protected against diphtheria in that crucial period, becomes apparent.

THE SCHICK TEST.

Supplies.—The supplies used are those furnished by the Health Department. Either of two outfits may be used for the test, namely, the capillary or the stock solution.

1. The capillary outfit consists of a capillary tube in a thin wooden box. This tube contains the unheated diphtheria toxin. A second capillary tube in a thin wooden box. This tube has a black mark at one end and contains the heated diphtheria toxin, for use in the control test. The toxin in this capillary tube is the same as that in the first tube, but has been heated to 75° C. for five minutes. The heating destroys the diphtheria toxin, which is the active agent in the positive Schick test, but does not effect the protein substance of the diphtheria bacillus, which produces the pseudoreaction. The black mark on the capillary tube is designed for differentiating the heated from the unheated toxin. Two small vials, each containing ten c. c. of normal saline solution, to be used as diluents for the toxin in the capillary tubes, one vial for the Schick test, and the other for the control. Two small rubber bulbs, one for each capillary tube. The contents of both vials, with the toxin introduced, are sufficient for thirty-five tests and if kept on ice are good for use only twenty-four hours.

2. The stock solution outfit: Since the capillary Schick test outfit can only be used for twenty-four hours, a stock solution can be made which is good for a longer period. The supplies and the method of preparation of the toxin solutions are as follows: One vial containing two c. c. of original diphtheria toxin, from which all stock solutions are made. This toxin is not ready for use. To be used it has to be diluted. If kept on ice, this toxin is good for two months. From the original diphtheria toxin, (a), a primary stock solution is made as follows: One c. c. of this toxin is added to six and a half c. c. of normal saline solution and the mixture shaken. This primary stock solution is not ready for use. To be used it has to be further diluted. If kept on ice, this primary stock solution is good for two weeks. One c. c. of the primary stock solution, (b), is added to ninety-nine c. c. of normal saline, or 1 c. c. of the primary stock solution, (b), is added to 9.9 c. c. of normal saline, or .1 of saline solution is withdrawn from the 10 c. c. saline vial, and that amount (.1) is replaced with a similar amount of the primary stock solution, (b), and the mixture is shaken. This latter

solution is the secondary stock solution. It is the final dilution and ready for use in the Schick test.

TECHNIC OF THE TEST.

Directions for the use of the capillary outfit in the Schick test:

1. Break off one end of the capillary tube not having the black mark.
2. Push the broken end of the tube through the neck of the rubber bulb, until it punctures the diaphragm and enters the cavity of the bulb.
3. Break off the other end of the tube.
4. Expel the contents of the capillary tube into one of the vials containing ten c. c. of saline solution by placing the index finger over the opening in the larger end of the bulb.
5. Rinse the capillary tube by drawing up saline solution several times.
6. Cork the saline vial and shake the diluted toxin.
7. Inject 0.2 c. c. of the diluted toxin, representing one fiftieth M. L. D. for the guineapig, intracutaneously on the flexor surface of the left forearm.

The procedure for the use of the capillary outfit in the control test is identical with that employed in the Schick test, but using the capillary tube with the black mark, and making the injection on the flexor surface of the right forearm.

Directions for the use of the secondary stock solution in the Schick test: Inject 0.2 c. c. of the final dilution, i. e., the secondary stock solution, intracutaneously into the flexor surface of the left forearm, the same way as is used with the capillary toxin. Whenever possible the capillary toxin should be used in preference to the stock toxin in making the Schick tests, as the capillary toxin requires no dilution and no preparation, being ready for use as it is. The stock solution should only be used when Schick tests are infrequently made, and the number of cases to be tested but few. In other words when we wish to have a reserve supply of Schick toxin, to be used as occasion arises, the stock solution is preferred. However, for the general practitioner the capillary toxin is recommended for all occasions. For the control test the capillary control outfit is used in either case, whether the Schick test is made with the toxin in the capillary tube or with the toxin from the stock solution.

METHOD OF INJECTION.

This is the same in all tests, in the capillary Schick test, in the capillary control test and in the stock solution Schick test. The procedure should be uniform in all tests, and conducted as follows: Sterilize the skin with cotton soaked with alcohol and then insert the needle into the skin. An efficient guide for the introduction of the needle into the proper layer of the skin is to be able to see the oval opening of the needle through the superficial layers of skin cells. A definite, blanched, circumscribed, wheellike elevation, the size of a dime, with the markings of the openings of the hair follicles distinct, shows that the injection is properly made. An ordinary one c. c. hypodermic syringe, with a fine half inch steel needle can be used for the injections. The site of the injection need not be covered.

THE REACTIONS.

The reactions should be observed at the end of twenty-four and forty-eight hours, basing the final judgment on the last reading. In case of doubt, a reading should also be made at the end of four days.

1. The positive (+) reaction becomes apparent at the end of from one to four days, generally at the end of two days, at a time when the pseudo element of the reaction has disappeared. It consists of a definitely circumscribed area of redness, from one to two and a half cm. in diameter, with a superficial scaling and a beginning brownish pigmentation. A strongly positive reaction will occasionally show vesiculation of the surface layers of the epithelium. The reaction gradually disappears in from one to four weeks, going through various stages of scaling and pigmentation. After about two weeks a distinct brownish area is seen at the site of the injection.

2. The negative (—) reaction. In most cases nothing is seen at the site of the injection. In a small proportion of cases a pseudoreaction is manifest.

3. The pseudoreaction shows an indefinite area of redness of varying size, surrounded by a secondary areola, which shades into the surrounding skin. The pseudoreaction appears earlier than the positive reaction, in from six to eighteen hours, reaches its height in from twenty-four to thirty-six hours, and has disappeared by the end of from two to four days, at a time when the positive reaction becomes apparent, and may leave a poorly defined area of pigmentation, but generally no scaling.

4. The combined reaction is a reaction showing a positive and a pseudoreaction in one. The positive element of the reaction becomes apparent at the end of from two to four days, at a time when the pseudo element of the reaction has disappeared. The appearance of the positive element of the reaction is that described under 1. The appearance of the pseudo element of the reaction is that described under 3, and resembles the reaction at the site of the control test, if there is a reaction at the control, with which it should be compared.

5. The doubtful (+ —) reaction. At times doubt arises as to what the reaction really is. The reaction may not be typically positive, or typically negative, or typically a pseudoreaction. In such cases the leaning should be toward a positive reading.

6. In the control reaction, as a rule, nothing is manifest at the site of the control test. Occasionally the control test shows a pseudoreaction.

INTERPRETATIONS OF THE REACTIONS.

1. A positive reaction. If the person tested is not immune to diphtheria, the toxin in the Schick test will exert its irritant action, and the reaction is positive. A positive reaction shows that the individual has no antitoxin in his blood, showing that he is not immune to diphtheria, and that he needs active immunization against diphtheria to render him immune against the disease.

2. A negative reaction shows that the individual

is immune against diphtheria, and, therefore, needs no active immunization. It also indicates, in children over eighteen months of age, the development of a natural immunity against diphtheria, which apparently is permanent.

3. A pseudoreaction has the same significance as a negative reaction.

4. A combined reaction has the same significance as a positive reaction.

5. A doubtful reaction should be considered as a positive reaction, and, therefore, requires immunization.

The Schick test is positive between the ages of one and four years in about thirty-two per cent. of normal children. It is positive in a slightly larger proportion of measles cases, in twice as many cases of scarlet fever, and in nearly three times as many cases of poliomyelitis. Susceptibility to one of the less contagious diseases, like poliomyelitis, indicates that the child is more likely to be susceptible to other contagious diseases. After the sixth year the proportion of positive reactions rapidly decreases, being positive in from four to ten per cent. only. In adults eighty-five to ninety-five per cent. of the tests are negative.

ACTIVE IMMUNIZATION.

For active immunization against diphtheria a solution of undiluted diphtheria toxin and antitoxin is used. This mixture of toxinantitoxin is slightly toxic and represents about eighty-five per cent. of an L+ dose of toxin to each unit of antitoxin, there being three units of antitoxin in one c. c. of the mixture. The immunity produced is probably permanent. Three injections, of one c. c. each, irrespective of the age of the individual, of the toxinantitoxin mixture are given at seven days' interval, the first being given as soon as a positive reaction is noted. The injections are made subcutaneously in the arm at the insertion of the deltoid muscle, after having painted the skin where the injection is to be made with iodine. The first injection is made in the right arm, the second in the left, and the third in the right.

The development of an active immunity is determined with the Schick test at the end of three months, i. e., all completed injected cases are tested three months after the last injection, to see whether they are then immune against diphtheria. If the test is negative, the person has been made immune against the disease and the case requires no further attention. If the test is positive the person is not yet immune and has to be reinjected and tested again after three months. By reinjecting those who still give a positive Schick test an active immunity can be developed in almost all susceptible persons.

Figures compiled at the Willard Parker Hospital show that from ninety to ninety-nine per cent. of the retests are negative; after one injection, about sixty per cent. are negative; and after two injections eighty per cent. are negative. As the immunity arising from the injection of toxinantitoxin does not develop until the lapse of from two to twelve weeks, active immunization with toxinanti-

toxin cannot be utilized to protect persons from exposure within that period.

Children between three and eighteen months should be actively immunized with toxinantitoxin, irrespective of the Schick test, so that an efficient immunity is produced during the ages of from one to five years, when the susceptibility of children to diphtheria is the greatest. This is necessary because the protection of the infant from the mother is only temporary, and usually lasts only from about six to nine months. All children over eighteen months of age should be tested with the Schick test, and only those giving a positive reaction should be immunized.

PERSONAL OBSERVATION.

I have conducted a practical study of the Schick test and active immunization against diphtheria with toxinantitoxin in my work in the Stuyvesant Clinic of the Department of Health. The obstacles encountered in my studies were numerous. The difficulties experienced were due, primarily, to the lack of enlightenment on the subject on the part of the parents. The general public knows but little about the Schick test, and about the efficiency of active immunization as a preventive against diphtheria. Those of the public who do know something about the subject are indifferent about it and are reluctant to subject their children to what they believe unnecessary inconvenience, especially in the face of perfect health. People are, of necessity, well versed in the indispensability of curative medicine, but are as yet unappreciative of the value of preventive medicine.

Ignorance and indifference were, however, not the only barriers in the successful completion of the studies undertaken. Having with great labor convinced a large number of the parents of the advisability of bringing their children to the clinic for the Schick tests, we were much less successful in having these children brought to the clinic often enough to complete the tests and the injections. In spite of the frequent and persistent home visits by our nurses to urge prompt attendance we were only successful in a very small proportion of the cases.

Sometimes the child would stay away on account of illness, other times attendance at school or other scholastic duties would detain the child; in still other instances, and not so rarely at that, it was fear that kept the children away. A good many of the mothers having consented to one injection would withhold permission for further injections. Then again, a large proportion of our patients moved before the tests and injections were completed, and no trace could be found of their destination.

On account of these unfavorable influences our research studies could not be complete in all the cases. Of a total of 434 cases Schick tested, seventy never returned for a reading. Of 111 positive Schick cases, only nineteen received the full series of three injections, and of these nineteen cases we were able to retest only twelve. Almost half of our positive cases only received one injection as they never returned subsequently.

RECORD OF THE CASES STUDIED.

Total number of cases Schick tested.....	434
Number of cases not returned for reading.....	70
Balance	364
Reactions:	
Negative	227
Positive	111
Combined	3
Doubtful	23
Total	364
Positive Cases:	
Not injected	28
One injection	49
Two injections	15
Three injections	7
Retested cases	12
Total	111
Retested Cases:	
Not returned for reading.....	2
Positive	2
Negative	8
Total	12
Combined Reaction Cases:	
Not injected	3
Total	3
Doubtful Reaction Cases:	
Not injected	19
Three injections, not retested.....	4
Total	23

ANALYSIS OF THE CASES ACCORDING TO AGES.

Positive Schick tests:	
Age: To 2 years.....	20
2-4 years.....	18
4-6 years.....	24
6-14 years.....	48
14 years and over.....	1
Total	111
Negative Schick tests:	
Age: To 2 years.....	18
2-4 years.....	33
4-6 years.....	37
6-14 years.....	136
14 years and over.....	3
Total	227
Doubtful Schick tests:	
Age: To 2 years.....	2
2-4 years.....	2
4-6 years.....	3
6-14 years.....	16
14 years and over.....	0
Total	23
Combined Schick tests:	
Age: 6-14 years.....	3
Total	3
Positive Retested Cases (after three months):	
Age: 2-4 years.....	1
14 years and over.....	1
Total	2
Note: These two positive retest cases received one injection each after the retest, but never returned for the subsequent injections.	
Negative Retested Cases (after three months):	
Age: To 2 years.....	1
2-4 years.....	1
4-6 years.....	1
6-14 years.....	5
Total	8

DEDUCTIONS FROM OUR STUDIES.

It is evident from these figures that more than a third of the children under fourteen years of age are susceptible to diphtheria, that is, have no natural immunity against the disease. The greatest susceptibility is found between one and six years. After the age of six years, the degree of susceptibility gradually diminishes, as shown by our negative Schick tests. Of a total of 227 negative Schick tests, 136 were between the ages of six and fourteen years.

Although the immunity produced by active immunization with toxinantitoxin was not quite 100 per cent. in our series, we can safely deduce that with repeated tests and injections, immunity against diphtheria could be produced in 100 per cent. of the cases. Naturally such results require the diligent cooperation of the patients.

Of our ten retested cases, eight were negative, and only two were positive, showing that with only one series of three injections of toxinantitoxin, we were able to produce an immunity against diphtheria in eighty per cent. of the cases. Had our two positive retested cases returned for further injections, there is no doubt in my mind that we could have made them react negatively to the Schick test, giving us an active immunity in one hundred per cent. of the cases.

Whether the immunity is permanent in all cases, we cannot positively state at the present stage of our investigations. Judging from the studies conducted at the Willard Parker Hospital, once an immunity is established it is probably permanent.

Advances in the knowledge of the medical sciences should be applied for the benefit of mankind. What could benefit humanity more than the prevention of disease? That is really what modern medicine is striving for. The motto now is "not to cure, but to prevent."

Considering the extent of the morbidity and mortality of diphtheria, it would be almost criminal not to utilize to the fullest possible degree the means at our disposal to curtail and check the disease. This can and should be done.

To have success crown our endeavors it is necessary to popularize the Schick test and active immunization both among the profession and the lay public. To begin with, doctors have to familiarize themselves with the technic of the test and the injections. Once that is done, they can urge upon their patients the advantages to be derived from the application of the test and active immunization. The Department of Health is conducting clinics in the different sections of the city, where doctors are instructed on the theory and practice of the test and immunization.

It is not sufficient to merely educate the profession on this important subject, the general public also has to be enlightened. This can be accomplished by means of lectures, films, and popular advertisements both in the newspapers and on bill posters. By such systematic and generalized distribution of knowledge and information, our endeavors surely cannot fail.

417 EAST EIGHTY-THIRD STREET.

NEPHRITIS.

By HYMAN I. GOLDSTEIN, M. D.,

Camden, N. J.

(Concluded from page 259)

Headaches occur which are often severe, commonly occipital or on top of head, may be associated with vomiting and twitchings or convulsions, and must be differentiated from brain tumor. Convulsions and coma are frequently late scenes. Forms of insanity may develop, such as uremic psychoses, delirium, melancholia, confusional insanity, and uremic narcolepsy. There may be much difficulty in diagnosing these cases. No albumin and very few casts may be present in many of these uremic states.

The gastrointestinal symptoms are many and varied. Salivation may occur. Long continued hiccough without fever and if not hysterical may often be uremic. Hiccough with fever occurs in pneumonia, typhoid fever, infections below the diaphragm, and abscess of liver. Riesman emphasizes the fact that vomiting without headache may be due to intestinal obstruction. Dysentery is not uncommon.

Eczema, severe and distressing pruritis, purpura, hemorrhagic diathesis are some of the more common cutaneous manifestations.

The uremic eye changes consist of albuminuric retinitis, depreciation of vision, blue blindness, violet blindness. The retinitis may be degenerative (granular kidney) or exudative and inflammatory (parenchymatous nephritis). Recurring subconjunctival hemorrhages may be uremic (nephritis and arteriosclerosis) in origin. Iritis may occur alone, or with albuminuric choroditis. Retinal hemorrhages and white spots (star shaped) are, of course, the most characteristic. The white or yellowish white spots occur near the macula, and often form a striking wide white area about the papilla (nerve head) or snow bank appearance of the retina (de Schweinitz). The retinal vessels are tortuous and beaded in appearance and less translucent and show whitish stripes (degeneration of walls).

DIAGNOSIS OF UREMIA.

The urine itself may fail as a diagnostic sign. Riesman, Christian and others have repeatedly pointed out that uremia cannot be diagnosed by the urine. Christian says no single renal test is pathognomonic of nephritis or uremia. The whole case, the history, the symptoms and repeated uranalysis must all be considered in reaching a diagnosis of real nephritis and the condition of the renal tissue. Tests of renal function may aid in diagnosis, and in the treatment as they measure the extent and severity of the renal lesion.

The functional tests, such as the Rowntree, Geraghty phenolsulphonophthalein test, the blood urea nitrogen estimation and the renal test meals all help to a correct diagnosis of acute and chronic uremia. There is present polyuria, urine is of low specific gravity, traces only of albumin at times, and few casts. Casts are nearly always present. There may be a fixed low level specific gravity or hypostenuria. Indican has been demonstrated in the

blood in uremia by Moraczewski, Herzfeld and G. Dorner.

Finally, the hypertension, which may show a blood pressure as high as 300 mm. of mercury systolic, and other characteristic cardiovascular changes, such as hypertrophy of the left ventricle, sclerosis and hardening of the vessels, with the frequent presence of systolic murmur and an accentuated aortic second sound without true organic valvular disease, and the eye ground examination complete the diagnosis.

The uremic vomiting must be distinguished from other causes of toxic vomiting such as those accompanying migraine and hyperthyroidism, pregnancy, cyclic or paroxysmal vomiting; and from the vomiting due to gastric crisis of *tabes dorsalis* and strangulated hernia, and alcoholism.

Hyperthyroidism, tuberculosis, diabetes, and other diseases, must be ruled out in cases of uremic psychoneurosis. Eclampsia, alcoholism, meningitis, hysteria, and epilepsy must be ruled out in cases of uremic convulsions and nephritic meningism. The very important and almost constant symptom of headache in uremic patients must be differentiated from the headaches occurring in various chronic intoxications, constipation and biliousness, eyestrain, psychoneurosis, sinusitis, meningitis, migraine, gout, lues, syphilitic periostitis, and brain tumor.

Uremic pericarditis occurs as a not uncommon complication in chronic interstitial nephritis. Of course, pericarditis is most commonly due to rheumatism, tonsillitis, and pneumonia, and any of these conditions may coexist in a uremic patient.

E. C. Segun (2) has emphasized occipital headache as a symptom of uremia. Intermittent headaches have also been mentioned as occurring in uremia by Von Leube. Bronchitis and asthmatic attacks often form part of the symptomatology of chronic and acute uremia. While bronchitis is most frequent, pericarditis is the most fatal.

Sudden blindness, amblyopia, with ringing in the ears with dizziness and more or less deafness have occurred in some of my cases early in the attack and have helped ward off more serious complicating symptoms by warning the patient; my resorting to venesection and the prompt use of depletory remedies have saved life at least at the time. The uremic deafness is probably of central origin; as in the sudden blindness, it is of short duration, lasting only a few days.

Curschmann states that in threatened uremia, the Babinski reflex often becomes positive before increased tendon reflexes or mental disturbance occur. Insomnia of several days duration, followed by hemiplegia, monoplegia or aphasia and paraplegia with pains in the calf muscles, have occurred most unexpectedly in some doubtful cases, with only slight symptoms referable to the kidneys and practically negative urine.

CONVULSIONS.

Uremic or renal asthma is a most constant symptom in uremia and Cheyne-Stokes breathing may occur. These attacks are likely to occur at night. The attacks of renal dyspnea are due to acidosis and

may be excited or made worse by the associated cardiac weakness or pulmonary edema. One of my patients nearly died recently from the pulmonary edema. The breathing may be that of air hunger or Kussmaul type. This hyperpnea may be considered as pathognomonic of acidosis. The acidemia breathing is deep, pauseless, not usually increased in rate, though the respirations may vary in depth, like a modified Cheyne-Stokes breathing, the excursions of the abdomen and thorax are nearly the same with succeeding respirations. Drowsiness may accompany this condition. The convulsions themselves, as stated, are the most characteristic symptoms of uremia. They are epileptiform in type, and they may be local or unilateral. Osler says they are supposed to be due to a local or general edema of the brain and are probably allied to the apoplexia serosa of early writers. They may come on suddenly or be preceded by nausea, vomiting, insomnia, vertigo, headache or dropsy. After the toxic rigidity, clonic spasms with fever and cyanosis and arterial spasm may follow at short intervals. The diagnosis cannot be made by the convulsions alone. In epilepsy convulsions are preceded by an aura, and unconsciousness is total and complete; the patient may bite the tongue and urinate; there is a history of previous convulsions occurring in younger patients. Clonic convulsions are present, after the rigidity subsides. The epileptic cry or shriek is characteristic.

Jacksonian epilepsy consists of convulsions which are usually unilateral and due to a focus of irritation on opposite side of brain. The unconsciousness is not total. General paralysis of the insane is manifested by convulsions which have a tendency to repeat themselves one after another. The Wassermann reaction would be positive, the test should be made with the cerebrospinal fluid and the blood. Acute infectious diseases, such as meningitis, scarlet fever, pneumonia, especially in children, may begin with convulsions.

Convulsions may be due to drugs such as strychnine. They are painful and are started by the slightest irritation. They are not accompanied by loss of consciousness. The jaw muscles may also become affected. The muscles of respiration are involved. Death occurs suddenly, due to respiratory spasm. Intervals of complete relaxation occur. Alcohol may cause convulsions very similar to epilepsy. There is a history of ingestion of some drug. Strychnine convulsions begin with gastric disturbance or tetanic contraction of the extremities. Objects appear green and hyperesthesia of retina occurs. The convulsions are violent from the onset. The gastric contents show strychnine; the course is brief.

Tetanus begins with lockjaw. The first convulsive spasm affects the jaw muscles, and consciousness is preserved. The convulsions later spread downward, the arms and hands escaping. Rigidity is persistent except in the chronic form. The course is prolonged for days or weeks. Cultures made from a discoverable wound may show tetanus bacilli.

In hysteria convulsions seldom occur when pa-

tient is alone. Usually the patient cries continually. There is no total loss of consciousness. The patient is erratic and has a dramatic attitude. Opisthotonus is sometimes present; it lasts a long time, a half hour or so. The patient is often emotional, crying or laughing. Stigmata may be present. The pupils are dilated. Spasms of hysterical laughing or crying may precede the convulsions. An aura is present, as in epilepsy. Globus hystericus, clonus hystericus with vertigo and tinnitus aurium and localized areas of tenderness or hysterogenous zones may be present. Reflex convulsions from parasites, eclampsia, myotonia, muscle spasm of a ticlike character, and Adams-Stokes disease are other conditions which must be differentiated.

Uremic unconsciousness coming on suddenly may simulate cerebral tumor, cerebral hemorrhage or a stroke of apoplexy, alcoholism or meningitis. In uremia there is an indicanemia and not in pseudouremia, and there is no nitrogen retention in pseudouremia. In diabetic coma the presence of sugar in the urine with acetone, the history, and the odor of the breath help make the diagnosis.

Opium poisoning must also be ruled out. Here the pupils are contracted and do not respond to light; the patient may answer rationally when aroused. In uremic coma consciousness is entirely abolished and pupils are generally dilated. In cerebral hemorrhage the pupils may be unequal or dilated; stertorous, flapping respiration is present; there is paralysis, and the urine may be negative.

SOME PHYSIOLOGICAL FACTS.

The secretion of urine is probably controlled through chemical stimuli. Certain substances in the blood, when in excess of a certain concentration, are secreted, because in some way they stimulate the activity of the kidney cells. The increased amount of urine that occurs when there is an increased blood flow through the kidneys is due to the greater amount of these chemical stimuli that pass through the kidneys.

Schaefer and Herring (3) have shown that a substance is contained in extracts of the posterior lobe of the pituitary gland which acts as a stimulating hormone to the kidneys, and it may be that this hormone may function normally. Cow (4) has stated that a stimulating diuretic hormone is formed in the mucous membrane of the intestine. When water is taken this hormone is carried into the blood with the absorbed water and is responsible for the resulting diuresis. It is stated that water taken by mouth causes diuresis, when a similar amount injected directly into the blood may have no effect.

The excretion of the kidney varies with the quantity of blood flowing through it. Landergren and Tigerstedt (5) have shown that when the kidney is in strong functional activity, as may be produced by the action of diuretics, it is a vascular organ. They estimate that in a minute's time, under the action of diuretics, an amount of blood flows through the kidney equal to the weight of the organ; this is an amount from four to nineteen times as great as occurs in the average supply of other organs in the systemic circulation. In strong diuresis, both kid-

neys taken into account, five and six tenths per cent. of the total quantity of blood sent out of the left heart may pass through the kidneys in a minute, although the combined weight of the kidneys makes only sixty-six hundredths per cent. of that of the body. Any vascular dilatation of the small renal vessels will tend to increase the blood flow through it, unless there is at the same time such a general fall of blood pressure as is sufficient to lower the pressure in the renal artery and reduce the driving force of the blood.

As to the urinary secretion, the weight of evidence favors the Bowman-Heidenhain theory, namely, that in the glomeruli water and inorganic salts are produced as an act of secretion, while the urea and related bodies are eliminated through the activity of the epithelial cells in the convoluted tubules.

Some diuretics may cause a genuine secretion while others influence the amount of urine through mechanical or physical influences alone. Saline diuretics probably attract water from the tissues into the blood and thus cause a condition of hydremic plethora, and an increased amount of urine is the result. According to Magnus (6), each inorganic salt has a secretion threshold.

TREATMENT AND PROGNOSIS.

Prognosis should be based chiefly on the history of the case, the symptoms and accidents the patient has had, and the results of the functional tests. The phenolsulphonephthalein test, as described by Rowntree and Geraghty, with the use of either the Dunning or modified Hellige colorimeter and an ampoule of the monosodium salt of phthalein (.006 to 1 c. c.) given either intramuscularly or intravenously. The average normal eliminations after intramuscular injections are fifty per cent. the first hour and eighty-five per cent. after two hours. Following intravenous administration, thirty-five to forty-five per cent. in fifteen minutes; fifty to sixty-five per cent. in thirty minutes and sixty-five to eighty per cent. in the first hour. The bladder should be completely emptied and one measured cubic centimetre of the phthalein solution injected into the lumbar muscles or intravenously. If it is injected intramuscularly, collect the urine excreted during an hour and ten minutes, also during a second hour, and estimate the amount of phthalein excreted, by the colorimeter. If given intravenously, collections and estimations may be made at the end of fifteen or thirty minutes, or an hour (7).

Urease may be used for the estimation of urea in the urine and in the blood. This preparation, soy bean, comes in twenty-five mgm. tablets. By the use of these two tests, a fairly accurate prognosis can be given in the majority of the renal cases. Urine analysis alone is not reliable.

TREATMENT OF ACUTE NEPHRITIS.

Acute nephritis is a curable condition in the majority of the cases. Acute or subacute glomerulonephritis occurs in scarlet fever, endocarditis, streptococcal infection, tonsillitis, appendicitis, influenza, exposure to cold, and other affections. Edema of the face, eyelids, fingers and hands are early symptoms, and treatment should be instituted promptly.

There may be trembling of the fingers, muscular twitchings and paralysis of one limb.

In Hughes shifting paralysis a foot, an eye, or a hand may be affected. Moisture is absent in the axillæ in all cases of acute nephritis. The kidneys must be activated because the patient may not void any urine. Water, which is the best diuretic, should be given in quantities of one, two, or three quarts a day, and water may be given by the Murphy drip. Diuretics, such as theocin, caffeine, agurin, and digitalis, should be avoided in acute nephritis. Orange juice or lemonade should be given.

EDEMA.

In Fischer's opinion, diuretics decrease edema, not because the secretory organs of the body have been stimulated to pull water out of the tissues, but because the diuretics act upon all the tissues of the body, and decrease, directly or indirectly, their hydration capacity and cause shrinking. The water is then thrown off by the kidneys, bowel, skin or lungs. Cohnheim's theory as to the edema is that it is due to increased permeability of the capillary vessels, which is caused by malnutrition or poisoning on account of the nephritis.

Widal believes that the kidneys have a deficient capacity to eliminate sodium chloride and the accumulation of salt in the body causes a retention of water, causing anasarca. Fischer's theory that the edema is due to an acidosis has not received confirmation. All of these workers attribute the edema to a retention of salt and water caused by kidneys' inability to eliminate them adequately.

Epstein, of New York, presented a hypothesis for the production of edema in chronic parenchymatous nephritis. He stated that the loss of protein incurred by the blood serum through the continuous albuminuria caused a decrease in osmotic pressure of the blood, which favored absorption or inhibition and retention of fluid by the tissues. Through a change in the protein composition of the blood plasma a condition was produced which was capable of causing the retention of fluid in the tissues. The increase in the lipid content of the blood, the decrease in the globulin content of the blood serum, and the excessive accumulation of lipoids constitute additional factors which contribute to the causation of edema in chronic parenchymatous nephritis, and interfere with the elimination of salt and water by the kidneys.

As stated, it is well to give the patient who is suffering from acute nephritis plenty of water to drink. The bowels and the skin should be activated. Citrate of magnesia is given. The patient is sponged with hot water; a hot pack consisting of a wet hot blanket is given for twenty minutes. Fortify your patient before the sweating by stimulation with aromatic spirits of ammonia. Permit him to sweat for at least twenty minutes, then use dry blankets. A glass or two of cold lemonade or ice water might make him perspire. Potassium citrate may be given as a mild alkaline diuretic. Enemata and a slow drip of sodium bicarbonate may be administered by rectum. Later, after recovery, Basham's mixture or infusion of digitalis U.S.P., freshly prepared, may be prescribed. If

the patient is comatose eight to ten ounces of blood or more may be removed, and water given by stomach tube or sodium bicarbonate solution by rectum or salt solution by hypodermoclysis. Do not give the sodium bicarbonate solution by skin. Soda solution should be given intravenously, by rectum, or by mouth. Nature has a tendency to cure acute nephritis, and we should not be too meddlesome or too active in the treatment. Many patients with acute nephritis following tonsillitis, influenza, scarlet fever, recover nicely without much treatment, other than by the avoidance of exposure, keeping the patient well covered, out of draughts, and the use of the mildest kinds of laxatives.

In the case of scarlet fever prophylaxis is most important. "Make the diagnosis of acute nephritis in scarlatina before you can see it," says Riesman. Watch the urine. If you find some red blood cells and a little increase in the albumin in the urine, tell the family and predict a probable kidney complication.

In bad cases with much dropsy, either one quart skimmed milk or buttermilk can be given a day. As the patient improves cereals and cocoa with sugar and various milk preparations; potatoes and rice may be ordered; no eggs until later. Either powdered digitalis or the fresh infusion may be used as a diuretic. I find the use of a freshly made U.S.P. preparation of the infusion of digitalis, after the real acuteness of the attack subsides, of great help in many of the cases. In very bad cases one may try thirty grams of digitalis leaves in a poultice over the kidneys or a hot flaxseed poultice may be applied.

After recovery the patients all have some secondary anemia. In these cases Basham's mixture may be given. At the expiration of three to five weeks the urine should be free from albumin. Iron is not of as much value in acute nephritis as it is in the chronic forms.

CHRONIC NEPHRITIS.

Since the blood shows a marked decrease in protein and an increase in lipoids and since the lipoid content increase gives evidence of a grave nutritional disturbance and its effect on the pathological condition of kidney tissue itself, Epstein advises to increase the protein content of blood and thus help regain its normal osmotic power and to remove or cause reabsorption by the tissues of the excessive lipoids. He advises, therefore, a removal of quantities of blood from the patient and massive infusions or transfusions of healthy blood in equal quantities. 1. The removal of the patient's blood avoids circulatory embarrassment and removes some excessive lipoids in the cases of chronic parenchymatous nephritis. 2. A proper administration of a high protein and fat poor diet is most important. It should consist of 1280 to 2500 calories daily. Fats should be excluded. Lean veal, lean ham, whites of eggs, oysters, lima beans, lentils, green peas, oatmeal, rice, skimmed milk, cocoa, split peas may be ordered. Large quantities of selected proteins are listed with a minimum of carbohydrates and exclusion of fats. Carbohydrates are restricted in order to allow for a maxi-

imum assimilation of protein and to exclude the greater production and retention of water which is incidental in the metabolism of carbohydrates. The fats are excluded because of the marked increase of faulty substances in the blood. The fluid in edema is made up principally of salts and water. The decrease in protein content of the serum is chiefly due to a loss of protein in the urine. Chaufford, Rechit and Grigaut in 1911 reported an increase in lipid content of the blood in chronic parenchymatous nephritis.

I speak of the diet first in the treatment of chronic nephritis because it is the most important single factor in the handling of these cases. In the usual case of chronic nephritis with edema very slight or absent, and without any of the other more or less acute disturbances, and with the patient feeling fairly well, I allow the following diet:

For breakfast

Grapefruit; cream of wheat and cream; cocoa, toast and butter.

or

Apple sauce; wheatena with cream; zweiback and butter or prunes; farina and cream; sliced oranges; apricots; rolled oats, etc.

For dinner and supper a selection is made from the following list:

Mashed potatoes; rice and cream; cream of onion soup; baked sweet potatoes; pineapple; buttered beets; creamed carrots; brussels sprouts with butter sauce; chocolate cornstarch pudding; stewed corn; chicken fricassee; orange ice; cream of tomato soup; hominy grits; lamb chop and a little sauerkraut for dinner; cream of asparagus soup; berries; small broiled chicken; celery; lettuce; two ounces of roast beef or none at all; baked squash or salmon; spinach; fruit salad; cream of celery soup; broiled trout; all kinds of vegetables; fresh and stewed fruits; fish, perch, cod, haddock, etc. No eggs are allowed. No salt. Meats in great moderation or none at all.

Some physicians advise the use of all kinds of fats, butter, cream and olive oil, in liberal quantities. Some advise the use of carbohydrates and sugar in abundance and eliminate the proteins, while still others, like Epstein, forbid the use of fats and restrict the use of carbohydrates and push the proteins, especially in chronic parenchymatous nephritis. I believe that a conservative happy medium of the three is, after all, the most satisfactory for all concerned.

If the patient becomes dropsical, order him to bed. Protect him with warm flannels. Order a milk diet and fruit juices. Fruit juices are very good in chronic cases of nephritis. Some diuretic should be used with caution; first, it is advisable to start with digitalis. Later, if necessary, three to five decigrams of theobromine may be used with the digitalis.

Agurin, theophorin, theophyllin, theocin, theocin-sodium acetate, diuretin and others may be tried in different cases, as needed, if the ordinary milder diuretics fail. The dropsy often disappears, without the use of any of these active diuretics. The bowels should be opened by elaterium or elaterine and the patient sweated by means of vapor bath, hot bricks and hot blankets, or electric lamps, and if necessary pilocarpine hydrochlorate a few minutes before the hot pack is administered hypodermically. In these cases if there is danger of pul-

monary edema or marked cardiac weakness do not use pilocarpine. A salt free diet helps dispel the dropsy.

Southey tubes are useful for the removal of large quantities of fluid from the legs and thighs; by their use I have removed a half gallon or more fluid in twenty-four hours. Multiple incisions through the skin, in both legs may also be made.

For the nervousness and insomnia I have used sedobrol, as a cup of hot soup or bouillon. Dial (Ciba), barbital or chloral hydrate have given good results. In bad cases if the heart requires stimulation I use digitan and caffen—sodium benzoate, hypodermically. In the uremic cases abstinence from nitrogenous and animal foods is urged. In these cases a lactovegetarian diet is best, with fruit, cereals and oysters allowed on improvement.

In the uremia, convulsions and coma, active treatment of the most vigorous kind is demanded and necessary.

It is most important to bleed the patient; the blood pressure is the guide. The skin and bowels must be kept working. Croton oil, 2 min., in olive oil or butter may be given, as well as elaterium, and later epsom salts with lemonade. Make the patient perspire freely and then stimulate the kidneys if possible.

In some of the cases with simple hypertension, without much demonstrable trouble in the kidneys, the arterial spasm and high blood pressure may be relieved by the use of benzyl benzoate, twenty minims in alcoholic solution every three or four hours. In some of the cases of the type known as climacteric hypertension, I have in a few cases seen surprisingly good results from the use of benzyl benzoate, and corpus luteum or ovarian extract; in others ovarian extract or lutein tablets were used with thyroid extract with favorable results. The iodides and nitrites do not do much good in the cases of essential benign hypertension. Bromides relieve the nervousness, and with tincture of veratrum viride relieve the dizziness and headache.

Anemia is always present; this can be treated by the administration of wine of iron citrate, Basham's mixture, or Bland's mass or by the hypodermic injections of citrate of iron, starting with small doses to avoid vomiting and faintness after its use.

Sometimes the patient's embarrassment of the heart suddenly increases and persists, due to a hydrothorax—this is likely to occur in dropsical cases. Here we must tap the chest, and if necessary the abdominal ascites should also be relieved by tapping. Pulmonary edema and albuminous expectoration after thoracentesis may be prevented by the administration of one sixth grain of morphine sulphate and one one hundred and fiftieth grain of atropine. The aspiration should be performed slowly and thoracentesis should be stopped as soon as the patient begins to cough persistently or becomes markedly dyspneic. Open pleural puncture as described by Schmidt may be tried instead of the usual method of thoracentesis.

ACIDOSIS.

This condition is relieved and reduced by the use of bicarbonate of soda solution. In all forms of acidosis, alkalies are indicated. They may be ad-

ministered by mouth, or intravenously, or by rectum. Avoid the subcutaneous administration of bicarbonate of soda solution. When a solution of bicarbonate of soda solution is boiled carbon dioxide is given off and sodium carbonate is formed. This is irritating. It has therefore been advised to pass a current of carbon dioxide through the solution until it is no longer colored by phenolphthalein. Oscar Schloss has found that bicarbonate of soda in bulk is always sterile. It is probably therefore sufficient to add the bicarbonate, with proper precautions, to sterile water according to Howland and Marriott.

In adults and older children 300 to 400 c. c. of the bicarbonate solution may be injected; in small infants not more than 75 to 100 c. c. Alkalosis must, however, be avoided. Edema may occur, but is usually of no serious consequence. Sometimes in young children tetany may occur following administration of soda solution—where such condition is feared administer a solution of magnesium sulphate subcutaneously—when large doses of the sodium bicarbonate solution are to be given (just as in idiopathic tetany), a four per cent. glucose solution can also be used.

In conclusion every patient with kidney disease must be carefully studied, and treated as an individual. No set rules apply to any one case. It is to be remembered, and it has been emphasized by Christian and others, that in nephritis as such, in uncomplicated nephritis of all types, diuretics are either not indicated because there is no need for increased urinary output, or where there is need for diuresis to remove edema or toxins, they do no good. In other words, in nephritis, as such, diuretics should not be pushed.

Reduction of fluid intake, salt poor diet, sweating, purging, and the use of alkaline remedies, with Southey tubes, or punctures, are far better for removing the edema. For toxic symptoms, bleeding, purging, sweating, and alkaline treatment are more efficacious than diuretic drugs. On the other hand, in patients with cardiac insufficiency and relatively little organic lesion diuretics are extremely useful to aid in the removal of fluid accumulated in the body. They are most efficient when given after a short period of digitalis (digitan, digalen, digipuratum, or powdered digitalis) therapy. In cases of edema of renal origin without cardiac insufficiency, digitalis alone produces no diuresis and when followed by a diuretic drug little or no increased urine flow results.

Theocin, with or without pulv. scillae or fluid extract apocynum cannabinum or cymarum, was in some of my cases more effectual than theobromin sodium salicylate, caffein, and potassium acetate in producing diuresis. However, when edema is in large part due to renal insufficiency, theocin, or agurin, or theophyllin or any other diuretic drug, fails to remove the fluid. They are, however, effectual in increasing urine output in cases associated with cardiac insufficiency.

ARRHYTHMIA.

In some of my nephritic cases, patients who were troubled with arrhythmia, paroxysmal or periodical attacks, and at times anginal spells, I used cactus grandiflorus, fresh tincture and convallaria

majalis, fresh fluid extract with or without tincture of prunus Virginia. Bromides and chloral hydrate in small doses do good, especially in older patients.

What I want to emphasize is the importance of infection in many of our cases of nephritis, especially in children. Such diseases as tonsillitis, appendicitis, sinusitis, and suppurative otitis media; chronic tooth infection and other focal infections; influenza, scarlet fever, and various septic conditions are important factors in the causation of acute and even subacute and chronic nephritis. I have seen a fairly large number of cases of nephritis in children following influenza, tonsillitis, and other acute infections of the nose, throat, ear, and appendicitis and enterocolitis. I could make a formidable list of these cases that would make interesting reading, but this is unnecessary in a paper of this kind, except to call attention to the fact that we must in the future take more interest in the cases of apparent slight acute infections, because of the frequent occurrence of a nephritis which may start as an acute condition, continuing into a chronic nephritis. Many cases of chronic nephritis in children are often of such mild character, and present such a totally different picture from chronic nephritis in the adult, that we often do not see these cases until long after the attack of a mild scarlet fever or a touch of diphtheria, or a quinsy tonsillitis or a touch of grippe or influenza. When these children happen to pick up another mild attack of an acute infection of some sort, there is an exacerbation of the chronic nephritic condition. Then it is that a flood of light strikes us and we discover we were dealing with a case of chronic nephritis in a child.

Most often the blood pressure is not elevated, but I have seen cases in children with blood pressure varying from 140 to 244 systolic and up to 130 and 140 diastolic. The urine often only shows a small quantity of albumin and possibly a few casts of the granular and hyaline varieties. There is an absence of cardiac hypertrophy, although I reported a case some time ago in a girl with an enormous heart complicating a case of nephritis—here the cardiac condition was primary. Of course, as Tyson has stated, prognosis is much more favorable if the heart disease is primary, and the renal disease secondary, even if there is extreme dropsy. Ordinarily cardiac hypertrophy following primary renal disease, is more marked than in primary heart disease. In primary renal disease, even in some of the cases occurring in children, the hypertrophy is principally of the left heart, whereas if heart disease is primary we get enlargement (and dilatation) also to the right.

There are many characteristic findings in adult renal disease which are totally absent in children. I have used in children, especially when acidosis may appear imminent, four per cent. bicarbonate solution by rectum and small doses of bicarbonate of soda and sodium citrate by mouth with splendid results. In these cases (infants and children) water should be given by mouth, by rectum, or intraperitoneally. The injection of water can best be made with a short needle, slowly, with all aseptic precautions, in the median line below the umbilicus;

as much as 300 c. c. may be given to a small infant. The fluid is absorbed gradually without throwing any strain on the circulation.

RÉSUMÉ AND SUMMARY.

1. The importance of focal infection in the production of systemic disease has been emphasized by the work of Frank Billings and others. The relation of foci of infection such as appendicitis, gall-bladder disease (cholecystitis and cholelithiasis), tonsillitis, endocarditis, prostatitis, otitis media and osteomyelitis, to nephritis, especially of the parenchymatous type, must be remembered.

2. The previous history of the patient and especially a history of any recent ailments and infectious disease such as scarlet fever, pneumonia, typhoid fever, influenza, has an important bearing on the diagnosis and prognosis and treatment of the renal condition in each particular case under study. One must not forget, however, that many cases of albuminuria are due to local sources of infection, which clear up entirely after the focus of infection is removed. In these cases medication and dietetics have no important place. The cases show no evidences of disturbed renal function and no definite renal disease is present in these symptomatic albuminurias. Barker and Smith (8), Riesman (9), Thomas, Cabot and others, have called attention to the importance of focal conditions to these so-called innocent and harmless albuminurias.

3. Diagnosis must be made from cyclic and orthostatic albuminuria, another allied condition—the diagnosis and prognosis can be made more accurately by blood chemical test and by renal function tests than by urine analysis. By determining the proportion of the urea in the blood to that excreted in the urine according to Ambard's laws and formula derived therefrom, an idea as to the power of the body to excrete urea can be obtained (10). As the urea in the blood increases it exercises a correspondingly greater diuretic stimulus, and the urinary urea rises proportionately. That is, in any given person Ambard's constant does not change even though the blood urea fluctuates very markedly. Therefore, this gives us a means of determining very accurately the degree of renal function present. Blood urea (the resultant of dietetic regulation and renal function) varies widely. Ambard's constant remains fixed unless the disease process changes and renal function either improves or deteriorates.

4. Dietetic treatment is of the greatest importance in the handling of cases of nephritis. The blood urea and creatinin content gives us indications for dietetic therapy. Ambard's constant furnishes information as to the progress of nephritis and indicates renal function when the blood urea may be as low as the result of dietetic therapy: 0.09 or less equals normal, 0.351 or over is a sign of impending danger (11). McLean's normal figure is 80 or higher and a change for the worse is indicated by a lowering of the constant (12).

5. Drug therapy is only occasionally of considerable help in true chronic nephritis. Diuretics and digitalis do good in cardiac cases where the kidneys fail. Digitalis, theocin, diuretin, caffen sodium

benzoate, potassium citrate, and other drugs may prolong life and stimulate the kidneys to increased action for a brief period only in chronic renal cases with poor kidney function, but sooner or later fail absolutely. Frequently patients with serious primary renal disease fail to respond to any medication—and it is important to keep this in mind, because more harm than good may be done by overmedication and meddling therapy in these cases. The phthalein test is an indication of progress in nephritis, and reveals the course of the disease as affected by therapeutic measures. Its prognostic value as to immediate and ultimate outlook and as to advancement of disease of the kidney as far as its function is concerned, is great, and an aid in the supervision of such cases. Chronic interstitial nephritis is an incurable disease. An active, comfortable life, however, is often compatible with this disease for many years. Chronic parenchymatous nephritis, on the other hand, is a very grave and serious condition which kills in two or three or four years. Change of climate, change of occupation, may help to prolong life. T. C. Janeway (13) says: "Caffen in small doses may give good results in edema cases."

In uremic cases the total amount of fluid administered should be at least 2,500 to 3,000 c. c. in twenty-four hours. You may give a ten per cent. glucose solution by mouth or by the stomach tube if the patient is unconscious. W. W. Palmer (14) has shown that acidosis occurs in many cases of severe nephritis as a result of kidney deficiency—here there is a deficient elimination of acid. Marriott and Howland have suggested the administration of calcium as an aid to the elimination of phosphates which are increased in nephritis. Bicarbonate of soda may be used with caution. The kidney holds back the alkali and therefore alkalosis may result. Note the depth of breathing and carbon dioxide tension in the alveolar air, and the quantity of carbonate in the blood as to the amount of alkali to be administered. Frothingham and Smillie (15) have shown how the nonprotein nitrogen could be diminished in the blood by a low protein diet. Finally, uric acid concentration of the blood is the most delicate test of renal function at our disposal. The first to increase in the blood is uric acid, next urea—while creatinin (16) increases in the blood only after considerable retention of urea had taken place and the nephritis was rather far advanced; that cases with five mg. of creatinin or more almost invariably have a bad prognosis and when the blood nitrogen reaches sixty-five to the 100 c. c. the patient is in serious danger. Five mg. creatinin and sixty to sixty-five mg. urea nitrogen in 100 c. c. blood is a death verdict for the patient—the prognosis being absolutely hopeless in many of these cases.

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Editorial Notes and Comments

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NEW YORK, SATURDAY, AUGUST 28, 1920.

PHYSICIAN AUTHORS—DR. ARTHUR SCHNITZLER.

As a rule, when physicians become eminently successful in literature and the rewards from the product of their pen mount to flattering heights, they give up the practice of medicine and devote their whole time to writing, feeling, no doubt, that circumstances do not warrant their serving two masters. There are always exceptions to prove every rule, and Dr. Arthur Schnitzler of Vienna is one of these. Despite the position he has won as a playwright and novelist throughout Europe and, in lesser degree, in America, he still clings, at the age of fifty-eight, to his first love, unremittingly attending to his activities as a general practitioner and maintaining his connection with the Clinical Hospital of Vienna, in which city he was born in 1862.

To the bulk of Americans Dr. Arthur Schnitzler is not very well known, but there is every reason to believe that in course of time he will be a familiar literary figure. For Dr. Schnitzler is one of the few great masters in modern literature. It is his frankness in dealing with some aspects of life, perhaps, that has retarded his introduction to the general reading public of America, but this handicap is being steadily overcome and Dr. Schnitzler's audience in this country is rapidly widening. For many years his plays have been produced in foreign language theaters and a start has been made with them on the English speaking stage, the first of such productions being his *Anatol*, in which John

Barrymore played the title rôle. The vogue of the printed play has also helped to introduce Dr. Schnitzler here, and translations of many of his twenty-five plays and playlets are obtainable. His plays are mostly of the one act type, full of shrewd wit and displaying a wonderful grasp of human nature. The critics are agreed that Dr. Schnitzler is the finest psychologist of the theater today, ranking on a par with Hauptman and Wedekind. All his plays, and the novels, too, have their satiric and comic side, even those in which tragedy is the predominant note, and as for those in which comedy is uppermost, there is always a vein of tragedy. There is no man writing today who gives us, in plays, novels and short stories, a more incisive dissection of human yearnings and foibles than Dr. Schnitzler.

The atmosphere of Vienna permeates all Dr. Schnitzler's work, for he has an unbounded love for the once gay old capital of the Austrian empire, and it will be interesting to watch his future treatment of the life of the city now that it has fallen on evil days. When what was formerly Austria-Hungary was fretsawed into an economic picture puzzle, Vienna, with a population of more than two millions, was left suspended, as it were, in midair. Where once it was the twin capital of a vast empire, it is now the centre of a tiny country that is hardly more than a suburb, and the consequences are, to say the least, distressing. But that it will continue to be a source of inspiration to Dr. Schnitzler there is no doubt, for he is still there in the midst of the new life with an observant mind and a rich storehouse of memory.

When Dr. Schnitzler adopted the practice of medicine he followed in the footsteps of his father, Dr. Johann Schnitzler, who was a famous laryngologist. He got his medical degree in 1885 at the University of Vienna and four years later began that connection with the Clinical Hospital which he still maintains. Meanwhile he contributed to *Weinar Klinische Rundschau*, a medical review of which his father was editor and publisher, and also contributed sketches, stories and poems to other publications. His hobby at this period seems to have been the investigation of psychic phenomena, for he published an article of comprehensive scope on the treatment of certain diseases by hypnotism and suggestion. He then went to London and there wrote his *London Letters*, exclusively devoted to medical subjects of wide range and variety. His original writings on medical subjects and occasional excursions into the byways of medicine are exceedingly voluminous.

They culminated in an exhaustive reference work compiled by him and his father, entitled, *Clinical Atlas of Laryngology and Rhinology*.

Although Dr. Schnitzler numerically is fifty-eight years old, he is said to possess an aliveness that would mean youth at any age. He is one of those men who seem to defy old age. An interviewer who chatted with him recently in his beloved Vienna tells us that his gray blue eyes are warm and bright, and that his ample brown hair and trimmed beard give no hint of his years, in spite of the gray in them. He is rather square in build and therefore looks shorter than he is, and his muscles are as hard as iron. He gives the impression of a man who has taken the best bodily care of himself and his appearance gives him dominance in any group. But although Dr. Schnitzler seems to defy time, we know that he has given it considerable profound thought, for his latest work, a novel, *Casanova's Homegoing*, is founded on the horror of growing old. "A merciless soul vivisection" this book has been called, flawless both as a work of art and as a grim human document. The verdict is that of a European critic. We may have to wait a few years before we in America are able to verify it.

PRODIGIOUS MENTAL CALCULATORS.

The first prodigy in mental calculation was Nichomachos, about whom little is known. It has also been stated that the African slave traders were apt mental calculators, but no particular example has been reported in old literature. Mathieu le Coq, who lived in Italy about 1660, appears to have solved the most difficult rules of arithmetic at the age of six years although he did not write or read. If this statement is not completely legendary it places in evidence two characteristics almost constantly found in families of prodigious mental calculators—precocity and ignorance.

Tom Fuller, surnamed the negro calculator, is a curious example of an ignorant mental calculator. He knew neither how to read nor write and died at the age of eighty years without having learned. A contemporary of the negro was Jedediah Buxton, who lived in England from 1702 to 1762. He was a poor laborer who, although the son of a schoolmaster, had never received any instruction and could not even write his name. It is said that he was far below the average intellectually and it was with the greatest difficulty that he could maintain his numerous family. He fished in summer and worked as a thresher in winter. He pushed his mania for calculation to such an extent that when he came to London to be examined by the

Royal Society and was taken to see the play of Richard III he fixed his attention during the dances on the number of steps executed. There were 5,202 of them but he only occupied himself in counting the number of words spoken by the actors, 12,445, and this was found exact. He had learned the multiplication table and this was the only instruction he had ever received. Beside, he preserved in his memory a certain number of products which facilitated his calculation and were, so to speak, landmarks. He always reduced lengths to a peculiar scale, the thickness of a hair, and he well knew how many of these thicknesses there were to a mile. Finally, he had a very remarkable *coup d'oeil* and judgment of space, for he had only to walk over extensive grounds, taking long steps, after which he could give the exact surface. Like Fuller, he died at an advanced age, showing that these prodigies do not die young, as some have maintained.

Mathematicians who have been remarkable calculators represent a type distinct from prodigious calculators. Calculators like Fuller or Buxton remain such all their lives. They have not a mind open to mathematics and profit little, if at all, from any instruction given them. From infancy, mathematicians show a remarkable disposition for mental calculation, but for them this is simply an accident in their existence and they are destined to soar higher. Such is the case of Ampere, who from the age of four carried out long operations of mental calculation with the use of small pebbles, although he did not know the alphabet or figures, De Gausse, regarded as the greatest geometrician of the century, was a prodigious calculator when hardly three years old. In 1810, Zerah Colburn gave exhibitions in the large cities of America and Europe. He was an individual of mean intelligence and yet he maintained that he should be regarded as the greatest mind of the times. He was backward mentally, incapable of any practical application and, like his predecessor, a specialist at figures, but obdurate to all else. His faculties as a calculator developed spontaneously before he could write or read. Mangiamele, a little Sicilian shepherd, was ten years old when he came to Paris to be examined by Arago in 1837. He had discovered procedures of calculation which he used to solve intricate problems. On all other questions his knowledge was more than rudimentary. Dase, born in 1824, was a mental calculator of great note who not only was a prodigy but was also useful to science. To him is principally due the calculation of natural logarithms or numbers from one to a million. Yet he was a calculator in the strict sense

of the word; he would never learn the simplest geometrical proposition and in general had a very obtuse intellect.

Henri Wondeux, a young shepherd of Touraine, who was the object of a report by Cauchy at the Paris Academy of Science, easily carried out mentally the most varied arithmetical operation. He devised procedures, sometimes remarkable, for solving many problems usually treated by algebra. His memory for figures was highly developed and he could remember numbers composed of twenty-four figures. In everything else his memory was faulty. Bidder is a type by himself in the family of calculators. Born in most modest conditions he became through his intelligence one of the most distinguished men of science of his day. At no time in his life did he lose his aptitude for mental calculation, which increased with years, a fact that distinguished him from other calculators. His mental gifts were in part transmitted to his son and grandsons. This is the only case in which hereditary influence has been noted. In 1892, Jacques Inandi was presented at the Paris Academy of Science and Charcot was one of the commission designated to examine him, while more recently another case has been studied in France by Desrullés. The subject, Fleury by name, was born blind, and although not so prodigious as Inandi still he can be placed in the call of subjects under consideration.

The most recent work on the subject is Huntziger's thesis (Paris, 1913). This writer points out that there is a congenital disposition in these subjects, affirmed by the precocity of the phenomenon. Neither heredity nor environment plays any part, at least in most instances. The subject develops only a single memory, that of figures, and this special mnemonic faculty attains extraordinary proportions in some. They all have almost identical procedures for carrying out their mental calculations but they are not those of ordinary arithmeticians, and Huntziger finds that almost all natural calculators remain ignorant during their lives.

SOME CONCLUSIONS AS TO LEPROSY.

While the complacently resigned were pronouncing leprosy incurable, scientists and medical missionaries, great hearted men, have been and are incessantly toiling over its prevention and cure. The findings of the Leper Mission Conference in India last month are:

That leprosy is contagious, but slowly. It is not directly hereditary, children being free at birth, but susceptible at an early age. It is necessary to promote the earliest possible separation of infants from infected leper parents. The Conference believes

leprosy could be stamped out in India if all lepers were segregated, but as this presents many initial difficulties the segregation of pauper lepers should be first undertaken. The present type of mission asylum with sympathetic Christian management affords the best means of effecting a voluntary segregation.

For amending the Indian Lepers Act of 1908 the training of medical assistants in diagnosis and treatment was urged; the equipping of all leper institutions with a suitable laboratory; when the separation of the sexes is impracticable, the couple should be allowed to live together only on the understanding that any children born shall be separated from them as early as possible also that one parent, if presenting good prospects of recovery, should be separated from the leprous one. It was added that the method of treatment with the salts of fatty acid introduced by Sir Leonard Rogers had been lately tested by fourteen medical officers and assistants on lepers throughout India with most favorable results, seventy-two advanced cases showing marked improvement, but much research into this is still needed. The amendments are approved by foremost men such as Sir Ronald Ross. Sir Leslie Rogers, of the School of Tropical Medicine, referred recently to the shabby treatment the Medical Service in India had received from the bureaucratic Government in regard to special research, saying his own expenses were far in excess of his income. The appeal comes from men fighting daily, the ignorance of it from men who have only met lepers in the pages of Blue Books and—to them—tiresomely long reports.

News Items.

Honor for Dr. Biggs.—Dr. Hermann M. Biggs, health commissioner of New York State, has been awarded the honorary degree of Doctor of Science by Harvard University.

Huebner Prize Awarded.—The Huebner Prize for the best work on pediatrics has been awarded to Dr. Arvo Ylppö of Helsingfors, assistant at the Kaiserin-Augusta-Viktoria Haus at Charlottenburg, Germany.

Georgia Medical Association Officers.—At its annual meeting held in Macon in May, the Medical Association of Georgia elected the following officers: president, Dr. Edward T. Coleman, of Graymont; vice-presidents, Dr. Theodore E. Oertel, of Augusta, and Dr. Fred L. Webb, of Macon; secretary-treasurer, Dr. Allen H. Bunce, of Atlanta.

Changes in Mercy Hospital Staff.—The following appointments have been made to the staff of Mercy Hospital, Baltimore: Superintendent, Dr. Irwin O. Ridgely; Dr. L. H. Brumback, Dr. Hazen G. Chamberlain, Dr. J. A. Clarkens; Dr. John J. Erwin, Dr. Andrew J. Gillis, Dr. Benjamin Gold, Dr. W. F. Martin, Dr. E. L. Kaufman, Dr. W. K. McGill, Dr. J. W. Martindale, Dr. William J. B. Orr, Dr. Daniel J. Pessagno, Dr. J. M. Robinson, Dr. Sanford M. Rosenthal, Dr. Vernon I. Smith, and Dr. Robert B. White.

United States Civil Service.—The United States Civil Service Commission announces examinations for district medical officer (\$1,800-\$3,000) and assistant medical officer (\$1,800-\$2,750) in the rehabilitation division of the Federal Board for Vocational Education.

John B. Murphy Memorial.—It is proposed to erect a memorial to the late Dr. John B. Murphy, of Chicago, in the form of the John B. Murphy Memorial Hall of the American College of Surgeons, on a site in Chicago and at an estimated cost of \$500,000. The building would furnish a meeting place for medical societies, and it is also proposed to maintain there a pantheon of American medicine and surgery. The John B. Murphy Memorial Association is undertaking to raise subscriptions for the amount. One hundred thousand dollars has already been pledged provided the balance of the requisite sum is obtained.

Gift from English to American Surgeons.—Word comes from London that a silver gilt mace is to be presented by British surgeons to the American College of Surgeons (which includes Canada) as a memento of the work done in cooperation by British and American surgeons during the war. The gift is the suggestion of Sir Berkeley Moynihan, who has worked in collaboration with Sir Anthony Bowlby and Sir D'Arcy Power. The mace is the work of Mr. Omar Ramsden, who has modeled the head of the mace on the lines of a surgeon's mortar dug up in a Salonika trench. The design includes maple leaves and American eagles, the badges of the British and American Army Medical Corps, and the serpents of Æsculapius, while the name is introduced of Philip Syng Physick (1768-1837), the father of American surgery, who was a pupil of John Hunter and an ex-house surgeon at St. George's Hospital. An inscription reads: "From the consulting surgeons of the British Armies to the American College of Surgeons in memory of mutual work and good fellowship in the Great War."

New York State Vital Statistics.—The May death rate in New York state was 12.7, which is the lowest May death rate on record for the state as a whole and is 2.3 points lower than the May average in the five years 1913-17. The infant mortality, 88 deaths under one year in 1,000 live births, is 9 points below the May average in the five year period mentioned.

The communicable diseases which showed a case incidence in the state as a whole of 100 or more in 100,000 population were measles 1,175.1, syphilis 315.4, tuberculosis (all forms) 247.1, diphtheria 221.5, pneumonia (all forms) 198.6, whooping cough 172.9, scarlet fever 156.1, mumps 140.3, and chickenpox 133.8. The communicable diseases which showed a death rate of 10 or more in 100,000 population were tuberculosis (all forms) 127.8, pneumonia (all forms) 125.9, measles 14.5, diphtheria 14.5, and epidemic influenza 13.1.

Syphilis continues to show the notably high case rate which prevailed during the first quarter of 1920. The May rate of 312.6 represents the discovery during that month of 2,930 cases of the disease.

Dr. Gorgas Buried in Arlington.—The body of Major General William C. Gorgas was buried August 16th at Arlington National Cemetery. Preceding the army ritual at the grave, services were held at the Church of the Epiphany, attended by Cabinet members, members of the diplomatic corps, and representatives of American and foreign scientific societies. Among the pallbearers were Col. Sir William Smith, of the Royal Institute of Public Hygiene; Major General Merritte W. Ireland; Rear Admirals W. C. Braisted and Cary T. Grayson, and former Surgeon General Rupert Blue of the Public Health Service.

Rural Consultation Clinic.—The New York State Department of Health recently held at Goshen the first rural consultation clinic in the country, to assist local physicians in difficult diagnoses. It is planned to establish visiting clinics in other localities which are without x ray machines and needed laboratory apparatus. In conducting the clinic the following subdivisions were used: diseases of children, diseases of adult life, diseases of women, mental and nervous disorders; orthopedic surgery, venereal diseases, and oral surgery. Among the physicians who were to take part in the clinic are: Dr. T. Ordway, dean and professor of medicine, Albany Medical College; Dr. H. L. K. Shaw, president-elect, American Child Hygiene Association, and professor of diseases of children, Albany Medical College; Dr. J. F. Nagle, attending physician, Bellevue Hospital; Dr. E. J. Wynkoop, professor of diseases of children, Syracuse Medical College; Dr. G. W. Partridge, Bellevue and Post Graduate Hospitals, New York City; Dr. C. D. Post, professor of medicine, Syracuse Medical College; Dr. Charles M. Dunne, Norwich, N. Y.; Dr. F. W. Barrows, state medical instructor of schools; Dr. L. W. Hubbard, Dr. M. F. Lent and Dr. W. E. Youland, State Health Department; Dr. A. S. Moore, Dr. W. E. Kelly and Dr. W. A. Schmitz, Middletown State Hospital; Dr. W. O. Sandy and Dr. E. W. Fuller, State Commission for Feeble Minded, and Dr. C. B. Witter.

Died.

BELL.—In Williamsport, Pa., on Monday, August 9th, Dr. G. FRANKLIN BELL, aged fifty-nine years.

COOPER.—In New York, N. Y., on Monday, August 9th, Dr. Sherman Cooper, aged eighty-eight years.

DAVIS.—In Mackinac, Mich., Dr. Olga Davis, of Chicago, aged forty-five years.

HEIST.—In Philadelphia, Pa., on Sunday, August 8th, Dr. George David Heist, aged thirty-five years.

HEUEL.—In New York, N. Y., on Wednesday, August 11th, Dr. Emil Heuel, aged fifty-five years.

HOEY.—In San Francisco, Cal., on Sunday, August 1st, Dr. Matthew J. Hoey, aged thirty-eight years.

KARLSLOE.—In New York, N. Y., on Sunday, August 8th, Dr. William J. Karlsloe, aged seventy-one years.

MERENESS.—In Albany, N. Y., on Wednesday, August 4th, Dr. Henry E. Mereness, aged seventy-one years.

SHERMAN.—In Rochester, N. Y., on Wednesday, August 4th, Dr. James F. Sherman, aged fifty-eight years.

TILLAPPAUGH.—In Wolcott, N. Y., on Friday, August 6th, Dr. James J. Tillapaugh, aged sixty-three years.

Book Reviews

PSYCHOANALYSIS.

A General Introduction to Psychoanalysis. By Prof. SIGMUND FREUD, LL. D. Authorized Translation. With a Preface by G. STANLEY HALL. New York: Boni & Liveright, 1920. Pp. i-402.

A book of this sort is a rare acquisition. Whether its readers are psychoanalysts or not does not alter the unique value of the work. Naturally their interest will depend upon their point of view, but the inherent worth of the book lies outside this consideration. Perhaps never before has a man of high authority in his field so taken the public into his confidence, so patiently invited them into the scientific details and the broader implications of his subject. Freud's authority has been won through an unremitting toil by which alone he has mastered the field which today may truthfully be acknowledged his. One may not agree with his conclusions, one may dispute the wisdom of choosing such a field as his upon which to expend a life's labor, yet one cannot read this book with an open mind and not perceive that in so far as this has been his realm he has become master within it. Here he spares no pains to share generously the results of his experience with other thinking men and women.

One might even go so far as to admit that it is an actual field of service and because of his faithfulness and skill he has performed a unique work in the history of mankind. He himself makes no boastful suggestion. He is content with lesser claims, his contentment that of the worker too absorbed in his task to dream vain dreams. He merely points out the steps he has taken and calls attention to the lanes and bypaths of future possibilities both in psychotherapy and other psychological fields which temptingly open out of the narrower way already trod. At any rate the content of this book is worthy of close reading in order first to know psychoanalysis in the author himself and then in order to determine on what its assertions to practical success are founded. Psychoanalysis is obtaining ever wider recognition from all circles of interest. The least that one can do in an endeavor to keep abreast of progress is to understand the simple rudiments of a system which is taking such a prominent place.

Of course the book has an especial value to those closely concerned in the study and treatment of psychic disorders, and for that matter for any physician who is continually being brought face to face with all sorts of mental difficulties in his general professional contact with the sick. Here again it is of greatest advantage to approach this method of study of mental disorders through the direct teaching of the leader in psychoanalysis. For the acknowledged psychoanalyst this presentation of the subject is a detailed study of still greater value. It affords a summary of the essential principles of psychoanalysis. It reviews the various elements in the approach to the unconscious mental life and its mechanisms in unified and consecutive order. Any worker in this field admits at once the advantage of frequent review of these fundamental facts and

repeated discussion of their mutual relations. It is both stimulating and instructive to enter again in this simple manner into the author's own practical approach to the unconscious.

The often repeated objections of arbitrariness, narrow resistance to opponents, the insisting upon unfounded speculations, with which Freud's work has long been met, grow feeble before the patient explanations with which Freud has expounded the principles upon which he works and his experience in developing and applying them. His courtesy is manifest toward those who oppose and, more difficult still, toward those who, going part way, have then taken certain hard won hypotheses and twisted them to new meanings, which in some instances at least lack the directness and simplicity of Freud's own thought and practice. His openmindedness toward the real contributions of others as well as toward the possibilities of which he counts his life work only the beginning also win the respect of the reader and incite him to a more than passing interest in the subject presented. Freud has proceeded with such careful steps and his manner of presentation is so scientifically sincere that criticism is disarmed.

It is not possible to do justice to the various positive elements of the book and this for two reasons. Anything more than a brief survey of the topics discussed would only crudely represent what the author has accomplished in so more complete a form. The value of the book can only be reached by a close perusal of its pages. In the second place the book, aside from this instructive sequence of presentation, contains many rich nuggets of psychological truth, especially such as pertain directly to the subjects peculiar to psychoanalysis. The main subjects might be hastily enumerated in the order in which Freud presents them, the psychology of errors as his introduction to the unconscious, then the study of dream content and dream mechanisms, passing from this on to the relations of psychoanalysis and psychiatry with the definite application of the former to interpretation and treatment of the forms of neurotic illness. He touches briefly upon the relation of psychoanalysis to the actual psychotic manifestations but considers this field one of those in which advance is still mostly a matter of future rather than of present accomplishment. Certainly no one can leave the reading of the work without a far profounder knowledge of the psychic life, an understanding enriched both by this wide and profound survey of mental life and its mechanisms and by these many words of revelation with which Freud's interpretation abounds.

Was there not an ancient objection to psychoanalysis and to Freud based on resistance to the sexual content of his work? Any one with such a repugnance would find this a wholesome study. Let him not be deceived, sex is mentioned and in frank detail. It is handled, however, with all the dignified unreserve of a conscientious handling of facts. Again the reader has a straightforward opportunity to question himself whether the assertions

of psychoanalysis are wildly made. If he discovers they are not he finds himself at the end of his reading in possession of a clearer knowledge of the entire sex life of man and of its importance in mental disturbances. He gains an appreciation of its developmental history in each individual. He is able to review thus closely in its various forms the appearances of sex throughout childhood and adult life. He gains also a clearer appreciation of its part in sublimation as well as in partial sublimations and compromise reactions and in determining perversities. He comes to understand the necessity of a balance between the ego and the sex libido and the difficulties which present themselves in making such a balance. Whatever one's medical or psychological faith, one's knowledge of human psychic life is greatly increased by a careful study of this work. At the same time it has its special function as the most complete and comprehensive book on psychoanalysis yet produced.

A CHILD'S MIND.

The World at Seven. By BURNETT STEELE IVEY. Boston: The Stratford Company, 1920.

This little book of verse is interesting, as are all the productions of children. The world of this child was a real world, a very real world inhabited by policemen, grocerymen, candymen, and soldiers. Unlike the poetical works of many children the production of phantasy is not evident. One might recite the poems which are called historical, the ones about Jack the Giant Killer, Cinderella and King Alfred, but in all of these he is only giving back the things he has read about. He does not aspire to create new worlds. He is content to live in the worlds in which he finds himself, or at least to accept another world which has been created for him by someone else. He made his adjustments with ease. Either he has had his own way about things or he encountered few difficulties. A safe prophecy would be that he will find little difficulty in his studies, but unless a radical revolution takes place he will never be an artist. He may become a poet, but he will travel the ways of mediocrity.

A PRIZE NOVEL.

Atlantide (L'Atlantide). By PIERRE BENOIT. Translated by MARY S. TAMPE and MARY ROSS. New York: Duffield & Co.

In France Benoit was awarded a prize of 5,000 francs for having written this highly graphic adventure story. On the whole it recalls H. Rider Haggard. Benoit, no doubt, has done archeological work in the region and used the material he found in making his story. His portrayal of the desert leaves a distinct feeling of its solitude and mystery. The country he has selected is well adapted for the tale which he has told. So convincingly has he written that one stops to wonder about the significance of the rites which are described. Then there is the strange woman, powerful and beautiful, luring men to destruction. Of two comrades, one holds out and the other succumbs to her lures. The passion of the weaker man is so great that he slays his comrade in order to gain the woman, knowing full well that when she tires of him he will be put in a neatly numbered coffin to be placed in a great hall

where she keeps the souvenirs of her conquests. In order to prolong the story or to show more completely the weakness of man, he is allowed to escape. After this stormy adventure he is not contented and is ever seeking to find his way back to the arms of the woman and the niche which has been reserved for him. Such efforts must be rewarded in story books, and the reader is content to know that finally the fatal woman has learned his whereabouts and sent her henchman, the unpronounceable Cegheir-ben-Cheikh after him; if it is what he really wants, after knowing all about it, let him have it by all means.

VENGEANCE WITHOUT INDIANS

Indian Vengeance. By LIVINGSTON FRENCH JONES. Boston: The Stratford Company, 1920.

In this little book one would expect to find material of value to the anthropologist or at least interesting data in regard to Indian customs. From this viewpoint it is disappointing. Instead, we find an ordinary story that might have been told about any group of people in any locality by changing the scenery. The telling of a tale that has little value to science might be forgiven, but when we find the author stating it badly and approaching simple problems in a school boy manner it is more difficult to overlook the transgression.

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

PROCEEDINGS OF THE NEW YORK PATHOLOGICAL SOCIETY. New Series, Volume xix, 1919. Illustrated. New York, 1919. Pp. xc-173.

BIENNIAL REPORT OF THE BOARD OF HEALTH FOR THE PARISH OF ORLEANS AND THE CITY OF NEW ORLEANS, 1918-1919. Illustrated. New Orleans: Brandao Printing Co. Pp. vii-133.

FORESTS, WOODS AND TREES IN RELATION TO HYGIENE. By AUGUSTINE HENRY, M. A., F. L. S., M. R. I. A.; Professor of Forestry, Royal College of Science, Dublin. Illustrated. New York: E. P. Dutton & Company. Pp. xii-314.

THE LIFE OF BENJAMIN DISRAELI, EARL OF BEACONSFIELD. By GEO. EARL BUCKLE. In Succession to W. F. MONEY-PENNY. Volume 5 and 6. 1868-1876. With Portraits and Illustrations. New York: The Macmillan Co., 1920. Pp. xii-558.

THE SOUL OF RATIONAL PSYCHOLOGY. By EMANUEL SWEDENBORG. Translated and Edited by FRANK SEWALL, A.M. From the Latin Edition of Dr. J. F. Immanuel Tafel, Tubingen, 1849. Third and Revised Edition. New York: The New-Church Press. Pp. xxxiii-388.

HEALTHY LIVING. By CHARLES-EDWARD AMORY WINSLOW, D.P.H.; Professor of Public Health, Yale Medical School, and Curator of Public Health, American Museum of Natural History. Enlarged Edition. Illustrated. In two volumes. New York and Chicago: Charles E. Merrill Co. Pp. iii-405.

THE MECHANISM AND GRAPHIC REGISTRATION OF THE HEART BEAT. By THOMAS LEWIS, M. D., F. R. S., F. R. C. P., D. Sc.; Honorary Consulting Physician, Ministry of Pensions; Late Consulting Physician in Diseases of the Heart (Eastern Command); Physician of the Staff of the Royal Medical Research Committee, etc. Illustrated. New York: Paul B. Hoeber, 1920. Pp. xx-452.

Practical Therapeutics and Preventive Medicine

A Compendium of Treatment and Prophylaxis, Original and Adapted

TREATMENT OF SURGICAL SHOCK.

BY VINCENT ANTHONY LAPENTA, A. M., M. D.,
Indianapolis, Ind.

The structure of the question as framed naturally excludes any consideration of the several theories advanced for the explanation of this striking phenomenon. Much progress has been made in the elucidation of this question and while limiting this contribution to treatment, some brief reference will occasionally be made to some physiological and physicochemical facts on which my treatment of shock is based.

Answering the question, "How do you treat shock?" it seems that the personal method and ideas of the contributor are what is sought. Adhering to this, no academic reference will be made to the many therapeutic opinions in vogue, but these remarks will be strictly limited to my personal experience and practice.

It does not seem out of place in the consideration of the treatment of surgical shock, to say a few words about its prevention. The occurrence of surgical shock can be largely prevented in the majority of operations of election and in many instances greatly minimized. Traumatic shock resulting from severe injuries is usually treated in the same manner as surgical shock following operations. In the general scheme of prevention, particular attention is paid to the type of patient that is to undergo a major operation. Patients exhibiting neuropathic tendencies, especially when afflicted with diseases associated with disturbances of the central or sympathetic nervous system, such as exophthalmic goitre, are prepared for operation by a preliminary rest cure. Great attention is paid at this time to all the metabolic functions and any disorders, especially acidosis, are corrected before operation. The good to be derived from mental suggestion is never to be overlooked and a great deal can be done by allaying the fear that some patients feel to an exaggerated degree.

The choice of the anesthetic is of great importance. For the sake of brevity, I would say that the anesthesia necessary in a given case is in direct ratio to the severity of the operation and the physical and neurological condition of the patient.

The anesthesia must be sufficient to block as much as possible the conduction of pain stimuli to the vasomotor centre. A preanesthetic injection of morphine is essential and beneficial. In painful operations, especially on sensitive subjects, I believe that the addition of one one hundredth grain of scopolamine is of distinctive value. I have no hesitancy in affirming that it positively diminishes the likelihood of true shock. Among the factors tending to the prevention of shock the importance of gentle manipulations must not be overlooked. In operations on the abdominal viscera, especially when complicated by extensive and firm adhesions, proper protection of the exposed peritoneal surfaces by

warm, moist, gauze pads, sharp dissection of the adhesions and gentle handling of the viscera will greatly aid in minimizing shock. Rough handling of the viscera, severe pulling on mesenteries, forceful tearing of adhesions and undue prolongation of the operation are potent agencies for the production of deep and severe shock. The duration of an operation is intimately connected with the production of shock. I consider it one of the most important elements. A rapidly performed operation is less likely to result in shock even in the absence of precautionary measures than a long slow one, even when performed under ideal conditions. A moderate degree of speed is an essential virtue of a true surgeon.

TREATMENT OF SHOCK.

The treatment must necessarily be adjusted to the degree of shock present and to any complicating factors requiring attention. It is necessary therefore to individualize and it is thus that the best results are obtained. Patients exhibiting a mild degree of shock evidenced by a rapid, but not weak pulse, with increased respiratory movements, will usually respond to applications of external heat to the entire surface of the body. Morphine at proper intervals should be administered. An agent capable of increasing the contractions of the right ventricle, thereby overcoming and preventing venous stasis, is of distinctive value. I believe that pituitrin is the best agent, and I use it in doses of one c. c. every three or four hours in conjunction with morphine, until the pulse shows increased pressure and reduced number of pulsations. Digipuratum and other potent digitalis principles are often of great value. Where it is desired to administer a larger amount of fluid, physiological saline solution is administered by hypodermoclysis. With increasing experience I have come to regard the saline proctoclysis as quite unreliable and, I might add of very uncertain value. If a patient's condition demands the administration of even small amounts of saline solution, it is obvious that this can effectually be accomplished by the hypodermoclysis, avoiding thereby, the uncertainty of results from the rectal route which often amounts to nothing more than a lavage of the anus.

In patients exhibiting severe shock and particularly where there has been considerable loss of blood, intravenous administration of physiologic saline solution is of paramount importance. However, the following precautions must be observed. The amount must not be too large. Seldom should it exceed 750 c. c. It should always be administered slowly, as too rapid administration may cause a rapid dilatation of the right ventricle. The temperature of the solution, at the point of entrance into the vein, must never be below 98.6° F. It is exceedingly easy to add to the shock of the patient by injudicious intravenous medication. Intravenous shock is not a myth and can be induced very read-

ily by rapid administration of the fluid of low temperature, or of imperfect isotonicity. Through several years of observation, I have become convinced that in cases of shock requiring intravenous medication a physiological fluid of colloidal nature approaching that of human plasma would be of great value, and far superior to the ordinary saline solution. The formula I prefer is as follows:

Gelatine,	grams	5
Purified acacia,	grams	2
Sodium chloride,	grams	8.5
Potassium chloride,	grams	2.5
Calcium chloride,	grams	3
Distilled water,		1000

Dissolve the acacia and gelatine in the water at 80° C., filter through hard paper, add salts and re-filter, sterilize in autoclave. When hermetically sealed this solution will keep for some time. In hospital practice it is best to prepare it fresh weekly, in expectation of it being needed.

In patients exhibiting a tendency to acidosis, four gms. of glucose and eight gms. of sodium bicarbonate are added to the solution before filtering. Extreme cases of shock which have been preceded by severe hemorrhage may demand blood transfusion, which we practice, using the citrate method. With judicious use of this solution, transfusion will seldom be found necessary.

In summing up, I wish to state that the bodily temperature must be protected by external heat; that in extreme cases bandaging of the extremities is useful; that morphine must be used fearlessly; that the respiratory centre can be sustained by small doses of strychnine and atropine when indicated, that acidosis must be prevented by timely alkalization; that intravenous medication, while highly beneficial must be judiciously employed; and that last but not least, a hopeful, cheerful demeanor is essential in the presence of the patient and that it is conducive to rapid reestablishment of the vasomotor sensory equilibrium. A nervous, anxious, fretful conduct on the part of the surgeon and attendants cannot fail to react on the patient and create the impression of imminent danger resulting in further exhaustion of sympathetic inhibition with its attendant vasomotor failure.

347 NEWTON CLAYPOOL BLDG.

Milk Injections in the Treatment of Hypertrophied Mammary Glands.—Patel (*Lyon médicale*, April 25, 1920) reports the case of a young woman of twenty-four years with enormous enlargement of the breasts, of sixteen months' standing. The patient was married but had had no child nor miscarriage nor any signs of beginning pregnancy. The breasts enlarged after an attack of influenza in October, 1918, and were estimated to weigh five kilograms each. Aspiration with Bier cups and deep cauterizations were without result, and when first seen by the author the patient was seeking radical treatment. On the advice of Mouriquand Patel administered ten subcutaneous injections of five mils each of human milk on alternate days. On the fifteenth day the breasts began to recede, and thereafter rapidly decreased in size until they resembled deflated balloons.

Treatment of Tuberculous Joints.—Gustav Schwyzer (*Surgery, Gynecology and Obstetrics*, June, 1920) give the following procedure for the treatment of tuberculous joints: As to the methods of operating, incision and so on, we can briefly say that we generally followed Kocher's ways. We always were impressed that through his incisions good access could be gained to the entire diseased area, and it is most important that all the tuberculous tissue be carefully excised by exact dissection. If the disease is confined purely to the synovial membrane of the joint we limit our work entirely to the removal of this membrane, thus avoiding complete ankylosis. But if the bone is involved, the bone ends are exposed by energetic dislocation. We strip back the healthy, outer integuments and turn them back like the cuff of a sleeve. Now the diseased part of the bone is cleanly removed. If we aim at a complete ankylosis, a good apposition of the bones is imperative.

In every case we have used iodoform powder. Contrary to the general routine, we prepared the iodoform powder previously by boiling the same for half an hour in a 1:500 bichloride solution. This powder is rubbed into the entire wound surface, the bone, and the soft tissues. The superfluous, loose part of it is washed away with saline solution. Thus we always have avoided dangerous degrees of iodoform intoxication. In all our resections we drained the wound cavities with rubber tube surrounded by washed out iodoform gauze strips. Our buried suture material consisted of silk and linen. Silkworm gut is the best material for the surface. An abundant amount of absorbent gauze and cotton is used for dressing. A plaster of paris cast is put on before the Esmarch bandage is released. The drains are removed through windows in the cast within a week.

Though the bleeding into the cast was often considerable, we never noticed any alarming hemorrhage. The first cast was always made quite heavy with the intention to leave it on from four to six weeks. After that time the wounds were closed and in affections of the lower extremity the patient was allowed to leave the bed in a lighter cast. None of our patients with hip or knee resections remained in bed longer than six weeks. The patient was sent home in the second cast with the advice to return in two or three months. A much shorter time is needed following operation on the upper extremities. Fortunately in all our cases we did not have to resort to amputation. Only one patient left with a fistula after a resection of the elbowjoint. A second resection eleven months later brought on a definite cure also in this case.

Treatment of Vincent's Angina and Other Similar Infections with Chromic Acid.—W. Dubreuilh (*Journal de médecine de Bordeaux*, March 25, 1920) found the local use of arsenobenzol in Vincent's angina painful and not particularly effective. Methylene blue proved less painful but acted relatively slowly. Chromic acid solution proved more satisfactory than either of these agents. The saturated solution of this acid, such as is produced spontaneously when a bottle of the acid is left unstoppered for a few days, is employed, or, a few drops of water may be placed in a bottle of the

acid so that a few crystals of the acid remain at the bottom. The solution is applied with cotton tightly wound around a small stick of wood; a metallic applicator or glass rod will not do, as the cotton soon loosens and drops off. The cotton should be merely moistened and not thoroughly wet with the solution. The ulcers are immediately rubbed rather firmly with the cotton, so as to detach the false membranes and bring the drug in direct contact with the ulcerated surface. The patient is then at once requested to gargle with water, being cautioned not to swallow any saliva before doing so. The resulting pain is moderate. The patient should thereafter gargle several times a day with hydrogen dioxide solution diluted one in ten or with a one per cent. solution of resorcinol. Next day the ulcer is usually found clean, odorless, and without false membrane. By the third day it is red and undergoing repair. In occasional instances a second application on the fourth or fifth day is required. This treatment may be employed in all lesions similarly produced. In severe mercurial stomatitis it is a useful adjuvant. It does not act on the attending diffuse stomatitis but merely on the ulcers, which are perhaps due to added infection. In the rather frequent form of gingivitis manifested in a linear ulceration about the necks of the teeth, especially of the lower jaw, forming a grayish, gangrenous, and rather painful linear depression, cauterization with concentrated chromic acid cures the condition in a few days. This disorder occurs rather frequently during mercurial treatment, but may also develop independently. In applying the acid in these cases a pointed matchstick, or better a fine Japanese toothpick with a minute amount of cotton wound about it should be used.

Treatment of Lethargic Encephalitis.—A. Netter (*Bulletin de l'Académie de médecine*, March 30, 1920) estimates at 1,500 the number of recent cases of this disorder in the city of Paris, and at 10,000 in the whole of France. Italy and Austria are known likewise to have suffered heavily from it. The author reports the results from various forms of treatment in seventy-two cases. Considering the disease, like epidemic poliomyelitis, to be due to a filterable virus present both in the nervous tissues and in the nose, throat and mouth, he thinks the treatment should be conducted along three particular lines, viz., neutralization of the virus directly in the nerve centres by the use of a specific or nonspecific bactericidal preparation; elimination of the poison by various routes, and stimulation of the general defensive activity of the organism. The first of these objects would be attained by intraspinal injection of serum from persons already recovered from the disease, but such a procedure cannot yet be recommended in this disorder, partly because the presence of a neutralizing principle in convalescent blood has not yet been demonstrated and partly because the course of the disease is so prolonged that a very large number of injections would have to be given. Administration of hexamethylenamine by mouth is, on the other hand, always to be recommended, though its exact utility is still in doubt. Neosalvarsan injections seemed to do

harm in one case. Enlargement of the salivary glands and salivation having been noted in some cases, administration of jaborandi or pilocarpine to hasten elimination of the virus with the saliva is indicated. Adrenalin is always combined with it to antagonize heart depression by the pilocarpine, as well as to combat the asthenia commonly present in these cases and probably dependent upon fixation of the virus by the nerve cells of the endocrine organs. The measure most strongly advised by the author is the fixation abscess, instituted by injecting one or two mils of oil of turpentine in the outer aspect of the thigh. Hippocrates had already noted that in patients who recovered from *lethargus* a spontaneous abscess generally developed in some part or other of the body. Out of twenty-seven cases in which Netter injected turpentine, in nineteen an incisable abscess formed, and of these nineteen patients only one, a pregnant woman, succumbed to the disease, although fourteen of them had the myoclonic form of encephalitis, considered more deadly than other forms. Two patients out of the eight who did not form an incisable abscess succumbed before collection of pus had occurred, and the other six, in whom the turpentine had caused no local reaction, likewise succumbed. Out of twenty-five patients who received no turpentine injections, thirteen, or over fifty per cent., died. Fochier's theory that a fixation abscess draws away virulent matter from the general circulation to the point of injection has not been confirmed by experimental work, but the abscess does in some way yield benefit, probably by awakening a reaction in the organs in which the materials for defence against the disease are formed. Netter's pupil, Mozer, has shown, at least, that the bone marrow participates in the reaction, throwing out myelocytes into the blood stream.

Treatment of Pelvic Infection.—Theodore J. Doerlein (*Surgery, Gynecology and Obstetrics*, June, 1920) emphasizes the following points in the classification and treatment of types of pelvic infections:

1. The classification of pelvic infections into ascending and descending is not merely academic but of practical value for better analysis of the cases, especially with regard to prognosis.

2. Operations for descending pelvic infections are rarely connected with grave danger, once the infection has reached the quiescent or elective period.

3. One should seek to make a differential diagnosis in the ascending type, i. e., between puerperal and gonorrhoeal infections, before operation, as the prognosis depends on proper diagnosis.

4. Judicious conservatism is productive of best results.

Röntgen Ray Treatment of Surgical Tuberculosis.—Hans Iselin (*Schweizerische medizinische Wochenschrift*, June 17, 1920) says that as a chronic infectious disease surgical tuberculosis is not suited for radical operative treatment, even though the extirpation of a single primary focus might be an ideal procedure. He extols the value of the röntgen rays as being preferable in the treatment of this disease.

Miscellany from Home and Foreign Journals

New Laws Relating to Inherited Syphilis.—Carle (*Presse médicale*, April 24, 1920) notes that, according to the law of Colles, a syphilitic child procreated by a syphilitic father generally does not infect the apparently healthy mother, who may nurse the child without risk. This law, thus worded, should be abandoned as subject to erroneous and dangerous interpretation, and should be replaced by the following: A mother giving birth to a syphilitic child who exhibits secondary manifestations of syphilis soon after birth is always syphilitic herself, even if apparently healthy; she may therefore nurse the child in safety, but should be at once subjected to specific treatment which should thereafter be systematically continued. Profeta's law is as follows: An admittedly healthy child born of a syphilitic mother cannot contract syphilis through being nursed or through any other contact with her; such immunity is not perpetual. For this wording Carle would substitute the following more comprehensive statement: A child born of a syphilitic mother is himself generally syphilitic, in spite of his apparent normal condition at birth; he therefore has every chance of not being contaminated through lactation; this is not an absolute rule, however, and all children born under such conditions should be carefully watched, and the Bordet-Wassermann reaction carried out if possible before they are declared to be healthy. As a corollary to Profeta's law the author would state that the manifestations of so-called late inherited syphilis are only the tertiary expression of ordinary congenital syphilis, the secondary symptoms of which, manifested in the usual way in the course of the first few years of life, have been overlooked or otherwise diagnosed. There is no such thing as late inherited syphilis, but there are late symptoms of an overlooked inherited syphilis. The third law, that of conceptional syphilis, is to the effect that syphilitic fetus in utero may, through the placental vessels, contaminate its mother, in whom there may appear in the course of pregnancy secondary manifestations, without there having ever been noted any primary manifestations. Evidence tending to substantiate this law is practically nil. Blood analyses have plainly shown that where two of the three parties are infected with syphilis, the third is likewise infected. The syphilitic pregnant woman has in all likelihood contracted her infection in the usual way, the chancre having, however, been overlooked—a common occurrence in the female sex. The so-called law of conceptional syphilis should be deleted from our textbooks.

A New Pylorus.—G. Gore Gillon (*Practitioner*, June, 1920) says that when one sets about altering the mechanism of the alimentary tract it behooves him to do so in a manner that will produce no secondary liability. When we want to do away with the old pyloric gateway we must make certain that the new gateway is situated at the lower end of the stomach, and by a jejunojejunostomy some three and a half inches away from the new pylorus we can make sure that the food stream does not

mingle with the bile and pancreatic fluids till the proper time. He holds the no loop operation to be physiologically incomplete; the bile and pancreatic fluids find their way into the stomach, and he believes that the subsequent complaints are due to this result, while after the operation he describes digestion goes on naturally. He thus describes his operation: After opening the abdomen and exposing the part of the stomach required, he put in his right hand and brought up from the left of the spine ten inches of jejunum, counting from the duodenojejunal junction, immediately at the left of the second lumbar vertebra; three inches of this proximal loop were used to make the first anastomosis, leaving seven inches for the second. The gastrojejunostomy opening is made three inches in length. He and his assistant now change their gloves and then make the anastomosis between the two descending legs of the jejunum at a distance of three and one half inches below the stomach opening. The anastomotic opening itself should measure one and a half inches vertically. The gastrocolic omentum is attached to the jejunum near the stomach by two stitches, and any veins in the omentum tied. The abdomen is then sewn up in the usual way. The patient can lie in a recumbent position a few hours after the operation and need not be propped up; hence there is less strain on the abdominal stitches. He is fed with tablespoonfuls of water for a day, then peptonized milk in the usual way for a few days, and in a week is taking a fair amount of light food. On the twelfth day he gets two or three grains of calomel; prior to that his bowels are opened by rectal injections if required. He should lie on his back for the first three weeks and leave hospital on the 24th to 28th day. He claims that the results are uniformly good and that the patients are not only well, but very well. They put on weight and acquire a great capacity for swallowing large quantities of liquids without discomfort.

Lethargic Meningitis, Meningoencephalitis, and Encephalitis.—Bériel and Branche (*Lyon médical*, March 25, 1920) state that they have been struck by the occurrence, during the past year, of an unusual number of infectious states with special involvement of the nervous centres and presenting all intermediate types from radiculitis to radiculomyelitis, meningitis, and meningoencephalitis. By their consentaneous occurrence and curability these cases seemed to be allied. The most pronounced cases simulated tuberculous meningitis in their subacute course, cerebrospinal fluid reactions, temperature curve, and admixture of meningeal and encephalic manifestations, but recovery took place. Lethargic encephalitis is but a single peculiar expression of an infection of the nervous centres that may appear in various localizations, though doubtless due to a single, as yet unknown, cause. One patient presented violent myoclonic seizures, and death took place in a continuous epileptoid paroxysm; the autopsy showed, histologically, a diffuse meningoencephalitis.

Effects of a Serum Precipitin on Animals of the Species Furnishing the Precipitinogen.—Peyton Rous, George W. Wilson, and Jean Oliver (*Journal of Experimental Medicine*, March, 1920) attempted to determine whether serum used as antigen gives rise to injurious principles in the anti-serum, as the serum of infected individuals would form a convenient antigen in many diseases. They found that there is present in serum of high precipitin titer, which was produced by the repeated injection of rabbits with the blood free serum of guineapigs or dogs, a principle highly toxic for animals of the species furnishing the antigen. After intravenous injection of the serum severe shock or sudden death occurred, and there were produced locally acute inflammatory changes and profuse capillary hemorrhages. The serum was exposed repeatedly to washed red cells to remove the hemolysins and hemagglutinins with only a slightly lessened toxicity resulting, and the removal of precipitin by specific precipitation *in vitro* had no detoxifying effect. The symptoms produced in guineapigs and dogs after intravenous injections of the treated and untreated sera were similar to those of anaphylaxis, but attempts at desensitization failed. It must still be determined whether the toxic principle is a hitherto unrecognized antibody, or a toxic product of the interaction of precipitin and precipitinogen. Evidently the fluids of infected human beings cannot be practically utilized for the production of anti-serum unless the obstacle of the presence of the injurious principles can be somehow overcome.

Orthostatic Cardiac Acceleration of Abdominal Origin.—Préval (*Presse médicale*, April 21, 1920) believes that acceleration of the heart rate upon rising from the recumbent to the standing position is an abnormal and not a physiological phenomenon. It is due generally to disturbed equilibrium of the abdominal organs, particularly the stomach, and is the result of a reflex mechanism in which probably participate the gastric branches of the solar plexus. This reflex may be clinically demonstrated by the application of a hypogastric belt, which causes the orthostatic acceleration to disappear when it is dependent upon gastroptosis. Orthostatic cardiac acceleration may and should be treated by better hygiene of the stomach and by physiological reeducation of the abdominal wall. Such treatment is especially necessary where there is tachycardia on exertion, a condition often partly due to the operation of the abdominocardiac reflex.

Availability of Carbohydrate in Certain Vegetables.—W. H. Olmstead (*Journal of Biological Chemistry*, January, 1920), by the use of diastase and copper reduction, and by feeding to phloridzinized dogs, determined the sugar forming material in certain vegetables which are commonly used in dietaries of diabetics. Nearly all the carbohydrates may be washed out of the vegetables by cooking. Cabbage showed 4.4 per cent. of available carbohydrate or glucose by the takadiastase method, and five per cent. by the phloridzinized dog, while thrice cooked cabbage showed corresponding figures of 0.4 and 0.5 per cent. Cauliflower by the diastase method gave 2.8 per cent. of available carbohydrate, and thrice cooked cauliflower 0.8 per cent.

Spinal Analgesia.—A. E. Halstead (*International Journal of Surgery*, April, 1920) asserts that the indications for the use of spinal analgesia are in general: 1, Those cases where for any reason a general anesthetic is not considered safe, e. g., in intestinal obstruction with fecal vomiting. In general peritonitis, for the same reasons. Also in strangulated hernias, and in operations in old people, such as prostatectomy. 2, In traumatic surgery of the lower extremities, in crushing injuries. The solution injected into the spinal canal not alone produces analgesia, but in doing so also blocks the sensory tracts of the cord and lessens shock. 3, In disarticulations of the hip or in high amputations for conditions not depending upon trauma. These operations can be carried out with much less shock than if a general anesthetic is employed.

Letters to the Editors.

SEX GLAND IMPLANTATION.

CHICAGO, August 10, 1920.

To the Editors:

The public press of this country recently has been flooded with articles regarding the alleged work in sex gland implantation of Dr. Serge Voronoff of Paris. The *New York Tribune* of July 19, 1920, quoted him as saying that he had concluded that human glands were preferable to ape glands, which he had been using. He also said that glands from electrocuted criminals and from bodies dead of accident were available sources of material. He further said that if the New York profession would furnish patient and material, he would teach them how to do the work. How a man of Voronoff's scientific training could have overlooked my work I cannot understand. In the *Bulletin of the Chicago Medical Society*, March 7, 1914, and *NEW YORK MEDICAL JOURNAL*, March 21, April 4, July 11, October 17-24-31, and November 7, 1914, I published a large series of cases of human implantations of testes and ovaries taken from dead bodies. Most of these cases were successful. I made sections of implanted glands showing the hormone producing cells and new blood vessels. I have done up to date a large number of implants with most astonishing results as to rejuvenation and effects on various bodily functions. I also have done some animal experimentation. Some of my later work was published in the *Journal of the American Medical Association*. My work antedated any claims of Voronoff by six years. I challenge Voronoff to show that he has even seen, much less performed, a single human testicle or ovarian implant up to date. In his book, published this year, not a single such case is recorded. Why is it that the press of this country exploits foreigners who have done nothing and ignores the work of American workers, who have done much? And when will the chauvinistic foreigner discover America? I expect at any moment to learn that some foreigner has just written the Constitution of the United States or discovered Cape Cod.

Very fraternally,
G. FRANK LYDSTON, M. D.

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WHOLE No. 2179.

Original Communications

FRACTURES OF THE LONG BONES AND THEIR REPAIR.*

By ETHAN H. SMITH, M. D.,
San Francisco.

The type of fracture of any long bone has much to do, first, with the matter of reduction, second, with the healing of the fracture. Formerly we were taught to fear oblique fractures. Since the common use of the radiograph we find that but relatively few fractures are strictly transverse. We also find that the transverse fracture, when displaced, is likely to be difficult to reduce. This is because the muscles will not stretch without great force beyond the normal length of the part of which the bone is a portion. Oblique fractures slide readily into place with, perhaps, a shortening so slight as to be of no consequence.

Longitudinal fractures if not widely separated or complicated by more or less transverse fractures can usually be replaced without much difficulty. When complicated as mentioned, they are as a rule most difficult to replace. Comminuted and multiple fractures are always difficult to handle, both as to replacement and securing union. Open fractures are always to be regarded as presenting problems to be handled one at a time as each one occurs. Only general rules can be laid down, but these few rules are well nigh absolute if we are to expect success.

Gentle handling of all fractures is an absolute necessity if we wish good results. Rope and tackle, Hawley tables and such paraphernalia are a retrogression of a century at least in handling fractures. They substitute unnecessary brute force and thoughtlessness for skill and intelligence. To reduce fractures, all muscles concerned in the fracture must be relaxed. This can not be done by putting a portion of them on the stretch as is done by the rope and tackle or the Hawley table. Recent fractures, gotten quickly in the hands of the surgeon, rarely present great difficulty in reduction. Great swelling, huge extravasation of blood or rapid edema of the muscles may make reduction difficult. Any or all of these conditions make forcible reduction a reckless procedure. Increased hemorrhage and the probable rupture of muscular fibrillæ are to be expected from such work. More than that, they increase the difficulty of retaining the fracture in

apposition and increase the tendency to slough. Pain afterward is also augmented and unnecessarily so.

In the repair of bone new material is thrown out between the periosteum and the shaft of the bone and also from the medulla through the cancellous portion of the bone. Some reparative material is thrown out over a goodly portion of the broken surface providing the circulation has not been too seriously impaired. The periosteum does not form bone. It limits its formation and protects the bone. Strip the periosteum off a portion of the sound bone and prevent infection, and an exostosis will form which will be limited when again covered by the repair of the periosteum. Periosteum stripped loose from the shaft of bone will many times heal back in place, but it will never adhere to the end grain of cut or broken bone. An oblique fracture makes a quicker repair than a transverse fracture. There is a much larger surface to furnish material for repair, and the union does not have to be so complete in order to support the broken parts.

A notch out of the cylinder of the shaft of a long bone, due to a widely displaced small fragment, makes an awkward fracture to handle. The time required to fill in the space due to this displaced fragment may be so long as to prevent the calcium salts from being deposited and lead to a partial fibrous union. Widely separated fragments undergo the same process quite often.

In delayed union or nonunion, we have the ends of the fragments united by preliminary soft tissue. This if not reinforced by the mineral salts soon partakes of the nature of scar tissue, coats over the broken surface and blocks out the mineral salts. The ends of the fragments become sclerosed and harder than normal. Operating on these adjacent ends of bone and merely fastening them together by any device whatsoever, is a waste of time and a reckless surgical risk. We must go above and below the fracture into normal bone and open up a channel through which reparative material may be brought in to complete the union. Do not cut into or through excessively denuded, bruised or lacerated tissue to reach a fracture in operating upon it. Wait until the soft parts have recuperated. "Haste makes waste" in many illadvised operations on fractures.

All metal contrivances for the repair of bone are bad, and if used at all are to be regarded as a choice between evils. They are seldom required

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at all. The plate is one of the worst of all inventions. It does more harm than good, is a weak device, and has been largely discarded in the operative treatment of bone. Staples are justly obsolete and never should have been used. Silver wire has a limited use, and is valuable occasionally, not because it is silver, but because it is pliable and can be pulled into place and cannot bear enough strain to do much harm by cutting through the bone, thus hindering repair.

Kangaroo tendon offers the best material for binding fractures in place, but requires perfect technique to prevent infection. If it is infected it makes a bad mess. It should be placed in 1:1000 bichloride of mercury solution, not for the antiseptic effect of the solution, but to render it readily pliable so that it can be accurately placed and tied.

BONE GRAFTS.

Do not put in an intermedullary bone graft. It fills up the medullary canal and prevents restoration of the intermedullary repair and nutritive circulation of blood in the bone. It prevents a sufficient deposition of callus and often prevents union of the fractured shaft. The graft unites within the medullary canal leaving only the graft itself at the site of fracture. Refracture is sure to follow. It also frequently causes a throbbing pain at the site of fracture until the medullary canal is cleared of obstruction. In case of refracture it must be removed before union can take place as the result of further operative procedures.

Do not take a graft from the crest of the tibia. The bone is too compact and does not readily unite with the less dense bone into which it is inserted. It does not allow of the necessary flow of reparative material to the site of fracture. It leaves a damaged tibia that will not make a good repair.

Do not reverse the longitudinal axis of a bone transplant in taking it from one position to another. If you do, you will reverse all the nutritive channels within the transplant and perhaps have the transplant perish and the operation fail.

Never try to use damaged bone for a transplant. It will perish every time. Fit the transplant accurately into a carefully prepared seat. Do not jam it too tightly into place. Do not bruise or batter any of the bone. Do not place it in any solution. Do as little handling as possible and place it in site as quickly as possible. Do as little trauma as possible in handling any part of the work.

Do not leave periosteum on a bone peg to be placed within the bone as in the neck of the femur. Do not place a bone transplant in the central axis of the femoral neck, as it will lie in a bed composed largely of fat, which is a semimedullary tissue and the transplant will be wasted. The upper portion of the femoral neck is the most advantageous site for the transplant. Remember that the adult femoral neck from the greatest convexity of the trochanter major to the attachment of the ligamentum teres, is from three and three eighths inches to three and five eighths inches in length. It is never necessary to turn a round peg for this transplant. Use a quarter or three eighths inch bone chisel, graduated in quarter inches on one side. Cut a square hole in the shell of the trochanter. Gently

drive the chisel into the neck, loosening it gently from time to time. Drive it in about three inches in the adult bone. Lay the chisel bit on the anterior wall of the shaft of the exposed tibia and mark out a three and one quarter inch long transplant, the width of the chisel bit, with a scalpel. Saw out the graft right into the medullary canal. Gently detach it after sawing a point on the lower end. Carefully shave off the medullary tissue and strip off the periosteum and shove it home through the previously prepared chisel hole. Nip off the short protruding end and the job is neatly and quickly done. This method does away with an unsafe machine that cannot be well sterilized, prevents unnecessary trauma, preserves the vitality of the transplant and saves valuable time.

In fracture of the neck of the femur, when the line of fracture is near the head of the bone, replacement of the fragments is more difficult than when the fracture occurs nearer the trochanter. If the ligamentum teres is ruptured, thus destroying the artery which enters the head of the bone at the attachment of the ligament this fragment may be rapidly absorbed. Bony union between the fragments is also doubtful. If there are two lines of fracture, one near the head of the bone and one near the trochanter, the intervening fragment may absorb leading to fibrous union, or in fortunate cases a very much shortened neck of the bone. Whether or not the fracture is intracapsular or extracapsular has practically nothing to do with the healing of the bone, except that it makes a difference in the adjustment of the fracture. The disturbance of the blood supply is the controlling factor in the matter of repair, providing we know how to treat the fracture.

The terms intracapsular and extracapsular are rather ridiculous as usually applied to the neck of the femur. As an anatomical fact the neck of the femur is wholly intracapsular, except a small triangular portion near the digital fossa, posteriorly situated.

If an overriding fracture of the shaft of a long bone cannot be reduced by careful manipulation under an anesthetic, do not attempt to make a forcible reduction by means of ropes and pulleys, or a machine like the Hawley table, as you will do infinite harm to the soft parts. Although you may apply plaster of paris with the parts on the stretch while in position on the table, there is no certainty of the bone remaining in place when the patient is released from the table. The pain afterwards is unjustifiable. Pressure sores are common. Paralysis of the bladder has occurred and persisted for an indefinite time from the pressure on the perineum, the forcible reduction of fracture of the femur by means of the Hawley table. A much easier and by far better method is to make an incision, and by use of the simple device known as a bone skid, the fracture can be reduced quickly and easily and without harm. The part can then be put up in appropriate dressings with the muscles relaxed and with the certainty that the patient is not going to suffer unnecessary pain.

Bones cut smoothly and transversely to the long axis of the shaft unite slowly or perhaps not at all

even in the absence of any deleterious influence. Bones cut obliquely or longitudinally and spliced in that manner will unite very quickly under favorable conditions. One reason for this is that in the latter condition much wider surface is exposed and on account of the peculiar structure of the bone, larger nutritive channels are opened up, through which bone building material can be brought to the site of union.

Do not attempt reparative work on open fractures until after the soft parts have healed and all infection, latent or active, has ceased. Do not plate these fractures. Do not operate on any fracture under a week or ten days unless it is the patella, which may sometimes be sutured in five days. You invite infection by too early operation. By waiting, much extravasated blood is absorbed, many blood vessels have been restored and the lymph spaces occluded, rendering the operation nearly as safe as a clean operation on the soft parts. Otherwise, infection is the rule.

Never undertake to do a bone graft or operative repair of any fracture when there is pus in the wound or necrosed bone or active or latent infection in the tissues. That is an invitation to the most destructive infection with possible loss of life or limb. It certainly means a failure as far as repair of the fracture is concerned.

Do not use an unnecessary piece of catgut in fracture work. Heavy hemostats left in place for a few minutes will stop hemorrhage from small vessels and prevent infection from too much catgut. Bones and ligaments do not readily dispose of catgut.

Most fractures of the femur can be treated with absolutely satisfactory results by the modified Hodgen splint or by weight and pulleys and long sand bags.

Never use any sort of zinc oxide adhesive plaster for traction. It is not strong enough. It wrinkles and makes sores. It is irritating to the skin and is a most unsatisfactory material. Most surgeons use whatever adhesive material is handed them. Shiver's moleskin adhesive plaster is the only material fit to use for this purpose. This statement may not get much consideration, but Sayre would never have made the great record he did without moleskin adhesive plaster. He was absolute in his teaching on this point and he was right.

It is superlative folly for any surgeon to state that a fracture of the femoral neck cannot be successfully handled by straight traction and the proper use of sand bags. This method is vastly superior to all others if properly applied, better as to the safety and comfort of the patient, puts the bones in better apposition than any other method and gives unexcelled results. A small sand bag behind the trochanter is the factor added to the rest that keeps the broken surfaces from rotating apart. The method must be seen to be learned and moleskin adhesive plaster is essential.

All fractures of the leg, including fractures involving the ankle, should invariably be reduced with the knee semiflexed and never in the extended position. They should always be put on a splint or in plaster with the knee held in semiflexion and the thigh included to the hip in the dressing. This

excludes the Hawley table and obviates the use of brute force in handling these fractures.

Colles's fractures should be put up in a dressing including the arm so as to prevent pronation and supination. The fingers and thumb should be free and movement of the digits encouraged. Splints are bad as they cause clamplike pressure and favor adhesions. Tenosynovitis is all too common in these fractures. It happens in persons of all ages and by any method of treatment. Some biological product is liberated into the tissues in fractures near joints, causing adhesions and thickening of epiphyseal structures. Some day someone will explain what happens.

Do not do passive movements with joints when there is free movement between fractured parts near by. Pain and irritation and damage will result. Do not bake any bone or joint unless you want it for food. It means devitalization of tissue and permanent damage. Do not massage infected tissue until all infection has ceased.

Do not use sheet wadding under plaster of paris or to pad splints. It does not pad a part sufficiently. It wrinkles and makes sores. It irritates the skin. It stinks. It is unpardonably bad. Use a good quality of absorbent cotton.

Frequently large hemorrhages take place, sometimes deeply in the limb, sometimes under the cutaneous structures. In uninfected cases these hemorrhages rapidly form clots which are absorbed within a few days or weeks. The absorption of this blood, together with that escaping from the broken bone, often causes a rise in temperature of from one to several degrees. In compound fractures it makes us apprehensive as to whether the rise of temperature is due to this cause or to a beginning infection. A large clot of blood which is capable of being demonstrated should be carefully watched. Sometimes five or six or even more weeks after the occurrence of a fracture, even after the union of the bone, one of these large clots will begin to liquefy. Through a small opening, evacuate the broken down, liquefied blood clot, of course with strict surgical precautions. The liquefaction of the blood clot is evidence of infection which will certainly result in an abscess and widespread infection unless the disorganized blood is promptly evacuated. Place a wet compress, preferably one to two thousand solution of permanganate of potassium, over the part and bandage rather firmly. This will prevent refilling of the evacuated cavity.

701 PHELAN BUILDING.

Measurements of Goitre on the Living.—H. Hunziker (*Schweizerische medizinische Wochenschrift*, January 29, 1920) proposes as a standard scale of measurements by means of which the size of goitres in different regions and countries may be compared, the square area obtained by multiplying the breadth of the palpable thyroid by its height in centimetres. When the thyroid cannot be felt the record would be 0; when it is one cm. broad and one cm. high, the record would be one; measuring six by five cm. it would be thirty; measuring seventeen by twelve cm. it would be 204, and so on.

SPLENECTOMY, WITH REPORT OF TWO CASES.*

BY GEORGE I. MILLER, M. D.,
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The rarity of articles on the diseases of the spleen and their treatment, compared with the legions of essays on other anatomical parts, invites interest and enthusiasm in the study of this mysterious ductless organ. Organs in the body richly supplied with blood vessels and lymphatics and not provided with ducts are necessarily regulators of the complex human mechanism. These organs exert this systemic influence through the blood stream. To what extent the spleen is of value to the body cannot be determined by direct studies, since the spleen has no external secretion and no known internal secretion, and, furthermore, the removal of the normal spleen causes no serious bodily change.

Historically, splenic surgery is of great interest. As early as 1500, spleens were removed from animals without affecting their health. Krumbhaar says Aristotle suspected that the spleen was not essential to life. In 1549 Zaccarelli was said to have removed the spleen from a patient, with satisfactory results.

The earliest splenectomy in this country was done by Browne in 1814, the patient living and remaining in good health after the operation. In 1866, Quittenlaum, Spence, and Wells (1) removed spleens not only in cases of injury, but also from patients suffering with constitutional disturbances and splenomegaly. The revolutionary period of splenic surgery, however, must be considered from 1894, when Banti (loc. cit., 77) described the disease which bears his name.

The operations performed on the spleen are mostly splenectomy, splenorrhaphy, splenopexy, aspiration, and splenotomy. Splenectomy is advocated in a great variety of diseases and conditions, especially when the spleen is enlarged to twice or more its normal size. Clinically, the enlargement of the spleen is to be considered the barometer of systemic disturbance, since the spleen itself is seldom the cause of the disease.

Physiologically, the spleen enlarges following food intake and resumes its normal size after several hours. This enlargement may be due to the influx of blood from the celiac axis, during the process of digestion, the same source which supplies the stomach, the duodenum, the liver, and the pancreas with blood. Enlarged spleens caused by disease show constant pathological changes, irrespective of the clinical phenomenon. The spleen, on examination, reveals marked fibrosis, degeneration of the blood vessels and malpighian bodies, or swelling, or atrophy of the splenic pulp.

Elliot and Kanel state that the intramuscular injection of epinephrine contracts the spleen one third the size.

The function of the spleen has not been definitely established. It is known to have phagocytic properties, to develop hemolytic ferments, to act as a

mechanical strainer, and to divert a large volume of blood from the general to the portal circulation. It also directs bacteria and protozoa, toxic products, and worn out red cells from the blood to the liver for destruction. The spleen, therefore, in health is to be considered a desirable organ, while under certain conditions in disease it proves to be an untrustworthy, dispensable traitor, causing destruction of blood ingredients, the loss of which eventually kills the patient. Its timely removal, therefore, stops the progressive destruction and the patient recovers.

Traumatism of the spleen may result in: 1, Subcutaneous rupture, usually produced by falls, kicks, or the passage of a wheel across the abdomen. Congenital syphilis predisposes to rupture of the spleen during birth. 2, Open wounds of the spleen such as are caused by stab wounds and gunshot injuries. 3, Accidental injuries of the spleen have occurred by a trocar thrust into the abdomen for the relief of ascites or by a trocar thrust into the chest for empyema. The symptoms pathognomonic of injury of the spleen will be illustrated by the following case.

April 3, 1919, I was summoned in great haste to a private hospital, by a surgeon. He asked me to explain the collapsed condition of his patient, R. S., a married woman, forty-five years of age. She had been sick in bed about four weeks with pneumonia, followed by empyema. The physician had decided to treat the patient by introducing a large cannula into the chest and leaving it *in situ* for continued drainage, instead of by an open operation. About three hours before my arrival he thrust the cannula in the axillary line of the left ninth intercostal space. The patient experienced considerable pain and shortly afterward collapsed. I found her in bed, looking very pale, her lips were white, and the pulse was faintly perceptible. Abdominal percussion revealed dulness in both flanks. She showed all the evidences of abdominal hemorrhage.

I suggested a laparotomy, and on opening the abdomen we saw a typical picture of a ruptured ectopic gestation. After removing about two quarts of fluid and clotted blood, I demonstrated a ragged rent in the convex surface of the spleen, caused by the thrust of the cannula. I repaired the torn spleen with two mattress sutures and closed the abdomen. I transfused the patient, while she was still on the table, with 500 c. c. of whole blood. She made an uneventful recovery.

Movable and ptosed spleens can be anchored in position, except when torsion and strangulation of the pedicle have taken place; then splenectomy is indicated.

Maclaren relates the case of a woman, aged fifty-one, who suffered from palpitation, dyspnea and depression. The examination revealed an irregular tumor in the pelvis. Operation showed the tumor to be a wandering spleen with two complete turns in a pedicle ten inches long. Johnston collected eighteen cases of ectopic spleen from 1900 to 1908. MacDonald and Mackay, Solieri, Paterson reported cases of spleen in the pelvis, with acute torsion of the pedicle. In all cases splenectomy was performed with recovery. Benign growths and non-parasitic cysts of the spleen have been resected by

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Bircher. Splenectomy, however, proved to be the safer operation. A lymphangioma of the spleen was removed by R. H. Fowler. A case of multicystic spleen removed by splenectomy by Coenen was considered by him of lymphangiectatic origin. Johnston reported twelve cases of splenectomies for sarcoma with three recoveries. Bush recorded the case of a man whose spleen showed some whitish elevations on its surface suggesting sarcoma. Splenectomy was performed with recovery from the operation, but the patient died a few months later from metastasis.

Tuberculosis of the spleen.—Burke, in 1889, was the first to remove the spleen for splenic tuberculosis. Cases of splenectomy for primary tuberculosis of the spleen have been collected by Fisher showing twelve cases with four recoveries. W. J. Mayo reported a case of probable tuberculosis of the spleen, that of a young girl who died six months later from generalized tuberculosis. Bland Sutton believed tuberculosis of the spleen to be secondary to tuberculous foci elsewhere in the body. The spleen is frequently involved in children who die from tuberculosis.

Syphilis of the spleen.—Syphilitic spleens have been removed, with remarkable results, from patients who failed to improve under persistent anti-syphilitic treatment with salvarsan, neosalvarsan and mercurial remedies. The removed spleens showed encapsulated spirochetes. Splenomegaly is common in syphilitic children and is considered second in frequency to rickets. Gummata of the spleen are rare in both children and adults. Giffin in 1916 reported 6 cases of syphilitic splenomegaly showing marked anemia, a positive Wassermann and failure to improve under antisyphilitic treatment. The patients had changes in the liver and one patient had a gumma. Splenectomy, by removing the spirochetes within the organ, cured the patient.

Malarial spleen.—The removal of the spleen for chronic malarial splenomegaly is not generally recommended, although Finkelstein and Jonesco and others performed splenectomy with gratifying results.

Splenic anemia and Banti's disease.—Splenic anemia with splenomegaly and leucopenia is a chronic intoxication of unknown cause occurring in children and adults; at times in one third to one half of the cases it is accompanied with hemorrhage, especially from the stomach, and often terminates in Banti's disease with cirrhosis of the liver, jaundice and ascites. Balfour states that forty-two patients showing this type of disease were operated upon in the Mayo Clinic up to May, 1917. Splenomegaly usually preceded the anemia. The weight of the spleen in some of these cases has been increased from the normal 195 grams to 5,280 grams (Giffin). The enlargement was due to thrombophlebitis of the splenic and portal veins which occurred as a primary condition. Banti's disease is considered the advanced stage of splenic anemia—cases which have cirrhosis of the liver with ascites.

A. G. Gibson offers triple evidence that the disease is of parasitic origin: Splenectomy cures or alleviates the condition, the disease simulates

kala azar, and salvarsan acts beneficially. The pre-ascitic stage lasts several years. Gastric disturbance, abdominal pain, pallor and increasing weakness may be the attracting clinical symptoms. There may be a slight leucopenia and increased urobilin. As the disease progresses, the urine is diminished, high colored, with excess of urobilin. There may be diarrhea. Finally, cirrhosis of the liver and ascites are present. Some jaundice and emaciation can be observed. Splenectomy is a specific remedy in whatever stage of the disease the patient is found.

I operated in the following two cases belonging to this group:

CASE I.—G., D., aged forty-eight years, Russian. Admitted to the Jewish Hospital, Brooklyn, N. Y., September 8, 1915, and discharged October 8, 1915.

Family history, negative. Previous personal history, married twenty-eight years. Gave birth to six healthy children; never aborted; menstruation regular. Had typhoid fever at the age of twenty. For the past eight years she had had myalgia.

Present illness: Six years ago she was admitted to the Vienna General Hospital for pain in the abdomen and left side. She remained in this institution for four weeks and left feeling well. She arrived in America two years ago. Six months previously the patient noticed a hard mass in the left hypochondrium, which gradually increased in size. Two months before admission to the hospital, she had an attack of abdominal cramps which lasted twenty-four hours. Since then she had felt a sensation of weight and a sticking pain in the left side of the abdomen. She did not cough or vomit. She had lost about fifty pounds in weight in the past eight years.

Physical examination, adult female; well developed; anemic; not dyspneic; appeared chronically ill. There were no glandular enlargements. The abdomen showed a firm mass in the left side, extending from the tenth rib to the pelvis and to the linea alba anteriorly. The mass was somewhat tender. There were varicose veins of legs. Reflexes normal. Temperature, 101°; pulse, 100; respiration, 20.

Urine examination, specific gravity, 1020; acid; negative. Blood examination, red blood cells, 3,260,000; leucocytes, 7,400; neutrophils, 61; lymphocytes, 34; mononuclears, 3; basophiles, 1; eosinophiles, 1; hemoglobin, 70 per cent.

Operation, September 20, 1915. Ether anesthesia. Left upper rectus incision, peritoneum opened. Adhesions above and to left of the spleen separated without difficulty. Spleen delivered; ten by six inches in size. Pedicle tied with double ligature and cut. The spleen was removed. The abdominal wall was closed. Immediately following the operation, I transfused 350 c. c. of unmodified blood. Four to five accessory spleens, about the size of walnuts, were present. The patient made an uneventful recovery and has since gained about twenty pounds in weight and is in perfect health. She has been absolutely cured by the operation.

CASE II.—H. K., real estate, aged sixty-four years, Russian; lived in New York forty years. He

had eleven healthy children. His wife never aborted. The patient entered the Jewish Hospital of Brooklyn, October 9, 1919, for the relief of weakness, pallor, loss of weight and a large mass in the abdomen. The family history was negative.

Previous personal history: Had typhoid fever thirty-eight years ago; had had no malaria or syphilis. The patient suffered from chronic articular and muscular rheumatism for several years prior to ten years ago. He was never subject to colds or tonsillitis; never had gallstone colic or abdominal pain. His cervical, axillary or inguinal glands were never enlarged. The patient lost his left eye forty-three years ago from a bullet shot. His habits were good; occasionally drank several glasses of prewar beer. Denied venereal disease. Slept well; appetite good until four months ago; constipated.

Present illness: Four months ago the patient noticed a painless mass in the left side of his abdomen. In the course of a few weeks the mass grew much larger. He lost about twenty-five pounds in weight since he became sick and noticed a progressive loss in strength and marked pallor. He had no nausea or vomiting. No gastric hemorrhages or blood at stool. The patient consulted several physicians and was treated medically with large quantities of liquids, powders and pills without relief. He went to the Catskills for three weeks, which seemed to have improved his strength and color. The abdominal mass, however, remained the same size. On returning to the city he was referred to a specialist on internal diseases, who informed him that his spleen was enlarged, and recommended x ray treatment. He received seven x ray exposures at intervals of four days, each exposure lasting from fifteen to twenty minutes. After the first four exposures the spleen seemed to have shrunk to about one half the size, but later became even larger than before the treatment. He was then advised to have his spleen removed.

Physical examination showed an elderly man, five feet, five inches in height, with sallow skin, anemic, pale; left eye missing; right sclera not jaundiced; pupils normal. The patient was lying in bed. He appeared chronically ill. Most of his teeth were missing. Those remaining were carious and loose; tongue was coated; tonsils, negative; neck, symmetrical; no glandular enlargement; the skin was faintly jaundiced. There was no pruritis, no blebs, and no pigmentation. The heart was not enlarged. There was a faint systolic murmur at the apex, which was transmitted toward the left axilla. There was no angina. The pulses were of small volume and low tension. The arteries showed moderate thickening; somewhat tortuous. The lungs were negative. He did not cough; was never dyspneic or cyanotic. The abdomen showed a slight fulness in the flanks and shifted with change of position. The liver edge was felt two inches below the costal margin. The spleen filled the entire left half of the abdominal cavity, extending from underneath the left costal margin to the left iliac fossa and to the right of the linea alba. The glands of the groin were not enlarged.

Patient admitted to the Jewish Hospital, Brook-

lyn, October 9, 1919. Temperature, 101° F.; pulse, 104; respiration, 24; blood pressure, 130 systolic; 78 diastolic. Blood examination, red blood cells, 3,328,000; white blood cells, 3,000; polymorphonuclears, 64; lymphocytes, 36; hemoglobin, 55 per cent. The Wassermann was negative; urine examination, specific gravity, 1,015; hyaline and granular casts, few pus cells.

October 10, 1919, I gave him a blood transfusion of 400 c. c. of whole blood. October 13, 1919, blood examination showed red blood cells, 3,808,000; white blood cells, 3,200; polymorphonuclears, 70; lymphocytes, 30; hemoglobin, 65 per cent.

October 20, 1919, I gave him a second blood transfusion of 400 c. c. of whole blood. The blood examination showed, red blood cells, 3,840,000; white blood cells, 3,200; polymorphonuclears, 61; lymphocytes, 30; hemoglobin, 65 per cent.

October 22, 1919, under gas, oxygen and ether anesthesia, in the presence of a number of surgeons who attended the Congress of the American College of Surgeons, I opened the abdomen of the patient by making an incision in the linea alba, from the ensiform cartilage down to two inches below the umbilicus. On opening the peritoneum I evacuated about six ounces of serous fluid. The liver was smooth and extended three inches below the normal line. The gallbladder and appendix were normal.

The spleen filled the entire left portion of the abdominal cavity. It was smooth and hard. Extensive adhesions bound it firmly to the diaphragm, to the parietes and to its own bed. The adhesions were easily destructible so that I succeeded in breaking through them, without injuring the spleen. I enucleated the organ by lifting the lower extremity through the incision and then the middle and upper part until it was entirely out of the abdominal cavity. The spleen was then turned over to the left, which exposed the internal surface and its pedicle. Without much traction on the pedicle, I divided it between two ligatures. I clamped and ligated the splenic vessels. After breaking up the adhesions and before removing the spleen, I packed several abdominal pads in the splenic bed to prevent hemorrhage. These pads were removed and the splenic bed and the pillar of the diaphragm inspected. Bleeding from the oozing points had stopped. There were no mesenteric glandular enlargements. The stomach and intestines were normal.

The abdominal wall was closed by four layers of sutures, without drainage, using bolsters, silk-worm and silk for the skin. The dressings were compressive and elastic so as to fill up the void left by the removal of the spleen. While still under the anesthetic, I gave the patient a postoperative blood transfusion of 500 c. c. of whole blood to overcome the shock, to increase his resisting power and to return the blood he had lost. Time of both operations, forty minutes.

The following day the patient appeared bright and cheerful and showed no sign of reaction. He had no chill. Temperature, 101°; pulse, 110; respiration, 24. During the second night he was restless; slept at intervals. Temperature, 102°; pulse, 130; respiration, 28.

October 24, 1919, I gave him the fourth blood transfusion of 400 c. c. of unmodified blood. From that day on he showed signs of gradual improvement. The suture line had to be opened on account of a stitch infection. Eleven days after operation he was in a wheel chair on the porch, and every day thereafter, the weather permitting.

Blood examination, November 1, 1919, red blood cells, 4,200,000; white blood cells, 8,000; hemoglobin, 65 per cent. November 6, 1919, temperature, 100°; pulse, 90; respiration, 20. During the early morning of November 7, 1919, he suddenly had a copious intestinal hemorrhage of venous blood. November 9, 1919, he had several hemorrhages from the bowel which exhausted him. The pulse became soft and empty. He was drowsy and muttering, but could be easily aroused by loud questions. He complained of no pain. November 10, 1919, he became unconscious and remained so until he died the following day. No autopsy was held. The spleen weighed five pounds and was smooth and hard.

Histologically, it showed no perivascular inflammation or thickening. There was no increase in interstitial fibrous tissue. It did show lymph granuloma denoting evidence of Hodgkin's disease.

Osler (2) states, "In Hodgkin's disease, whether or not there is a type involving the spleen alone without the lymph glands, is still a question. The disease may originate in the lymphoid tissues of the spleen. It is very difficult to distinguish such cases clinically from the early stages of Banti's disease." Pool collected four cases of splenectomy for the anemia of von Jaksch. Considering the fact that from a third to a half of the cases of splenic anemia have gastrointestinal hemorrhages without evidence of existing ulcer in the stomach or the duodenum, and that the removal of a small or slightly enlarged spleen from a patient with obscure gastric hemorrhage cures the patient, we are justified in believing such patients to be victims of unrecognized cases of splenic anemia.

Therefore after excluding every causative lesion which may cause gastric hemorrhage and bearing in mind the fact that the spleen is the root of infection which gives unaccounted toxic hemorrhage, I believe that such cases should be considered splenic anemia *per se*.

Hemolytic jaundice.—Nonobstructive hemolytic icterus with anemia and splenomegaly may be the congenital familial type of Minkowski and the acquired type of Hyam and Widal. The blood in these cases shows increased fragility of the red blood cells, which is to be considered the most important diagnostic sign. Bile pigment is also constant in the blood and urobilin in the urine.

Elliot and Kanavel were the first to report splenectomy in this disease in 1915. Nineteen cases of hemolytic icterus operated on in the Mayo Clinic are reported with gratifying results. The jaundice which existed for years disappeared within four days. About sixty per cent. of these cases had complicating gallstones due to thickened bile, the result of pigment derived from the disintegrated red cells. The patients showed chronic jaundice of a mild degree, not accompanied with itching or the clay

stools usually associated with jaundice due to obstruction of the common duct. Bile is always present in the stool. The spleen and liver were usually enlarged and often painful. Anemia was present. The patients with congenital and acquired types suffered more and were more likely to seek relief.

Minkowski, Eppinger, and Banti believe that the spleen is the destroying agent of the red cells and the fact that the removal of the organ cures the patient is convincing evidence to support this view. The reported cases of splenectomy in this disease with uniformly excellent results must be looked upon as a therapeutic measure well warranted in every case of the congenital and acquired type.

Pernicious anemia.—The removal of the spleen in cases of pernicious anemia effects a remission of symptoms to some extent. Percy suggests the removal of the gallbladder and the appendix as additional possible foci of infection which may be the causative factor of the disease. There is, however, thus far, no proof that splenectomy will cure the disease or permanently check the symptoms. The operation has proved of empirical value when performed early in the disease and before destructive changes have taken place in the cord. The anemia of the pernicious type is due to destruction of the red blood cells and not to inhibition of blood formation, and in the absence of any other evidence as to the cause of this destruction, the enlarged spleen should be considered a crematory, which, when removed in time, proves to be the best therapeutic remedy at our command. Its removal is followed by absolute improvement if not by actual cure.

Leucemia.—In splenomedullary leucemia, radium, the x ray and benzol temporarily exert specific effects on the spleen and on the blood picture, but remissions occur. The spleen under radium treatment is often reduced to a nonpalpable, normal sized organ and disappears behind the left costal margin. The several hundred thousand white cells disappear to the point of a leucopenia. In a short time, however, the spleen gradually increases again in size, the white cells increase in number, the red cells decrease and the patient is a physical bankrupt.

In the Mayo Clinic in nineteen cases of this class the patients were splenectomized after the blood picture had first been brought to normal by the use of radium, x ray and benzol. All patients recovered but thus far we have no knowledge of the end result.

The leucemic spleen is not adherent and after reduction by radium is easily removed. The removal of the spleen in cases of cirrhosis of the liver is justified on the theory that the spleen stimulates the liver to overactivity and to excessive hemolytic power. It is well established that the liver destroys bacteria and protozoa and detoxicates poisons brought to it from the portal circulation. In portal cirrhosis the liver is apparently exhausted and unable to eliminate all the poisons directed to it by the spleen, and there is an ultimate formation of connective tissue about the portal radicals. The spleen, which is always enlarged in portal cirrhosis, suggests that the source of the poisons is in the spleen and, furthermore, splenectomy improves the condition of the patient.

TECHNIC OF SPLENECTOMY.

The removal of the spleen is not a difficult operation. A median incision, or one to the outer edge of the left rectus muscle down to the peritoneum, four to five inches long, is made and, if necessary, supplemented by a transverse incision through the rectus. The peritoneum is opened. The intestines are pushed aside and the spleen exposed. The liver, the gallbladder and the appendix are examined. Adhesions when present are stripped with the fingers or clamped and ligated.

After lifting the spleen out of its bed, a large gauze pack, as suggested by Balfour, is introduced into the space formerly occupied by the spleen. This will aid materially in the checking of all oozing points and at the same time support the spleen. The spleen is elevated and drawn toward the midline and the pedicle ligated. Care must be taken not to include the tail of the pancreas in the ligature. This can be avoided by isolating the arterial and venous branches in the pedicle and ligating them separately. If the procedure is found inadvisable, ligation *en masse* by two clamps is easily carried out.

In cases where the splenic adhesions are excessive, the liberation is at times followed by profuse venous bleeding. This bleeding can be controlled in three ways: 1, ligation; 2, clamping the bleeding mass and leaving the clamp *in situ* for three days, then loosening it for about twelve hours, and if no oozing follows, the forceps are removed; 3, the placing of a gauze pack, as suggested by Balfour, and leaving it in place for a few days.

In pernicious anemia the spleen is removed without difficulty. In hemolytic jaundice the spleen is at times very large, but the operation for its removal is without danger. Greater operative risk is encountered in cases of splenic anemic and in hepatic cirrhosis and particularly in leucemia, since the blood of a leucemic patient possesses less than the normal power of agglutination.

Blood transfusion preliminary to splenectomy is a therapeutic remedy of great value by: 1, improving the impoverished and diminished quantity of the blood; 2, by toning up the system and preparing it for the shock of the operation; 3, by gauging the effect of the transfusion on the health of the patient.

When a patient responds favorably to two or three transfusions prior to operation, the removal of the spleen will probably effect a cure. On the other hand, if no improvement follows repeated transfusion, splenectomy may be of no value. Considering the great quantity of blood present in the spleen, its removal necessarily withdraws from the patient a volume of blood which should be replaced by post-operative transfusion. The usual amount transfused is from 500 to 750 c. c., and I consider whole blood, as nature has provided, preferable to modified, medicated blood. Changes in the blood picture following splenectomy were studied and recorded by Pearce, of Philadelphia, and his coworkers. There is a slow progressive anemia which appears soon after removal of the spleen and reaches its height between the fourth and sixth week and then the blood gradually reaches normal about the fourth month, but the hemoglobin continues to increase up to the tenth

month. The white cells show polymorphonuclear leucocytosis soon after operation and then gradually fall to normal at about the fourth month. There is also a transient eosinophilia, but no increase in the lymphocytes was observed.

The postoperative course of splenectomized patients is equal to that of other major abdominal operations. This depends mainly on the disease and the condition of the patient at the time of the operation. If a patient is brought to the operating table as a last resort, very little can be expected, unfair advantage is taken of the surgeon, and surgery is reflected upon when the result is unsuccessful. Timely surgical interference, after brief medical treatment has failed to improve or cure, will bring gratifying results to both patient and physician.

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HORATIO C. WOOD.

By HENRY BEATES, JR., M. D., Sc. D.,
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By the death of Professor Horatio C. Wood the medical profession and mankind in general have suffered an irreparable loss. His life was an example of sincerity of purpose, diligence, honest endeavor and justice, and an exceptionally powerful influence for the uplift, growth and development of those sciences with which he was identified. Endowed with an unusual mind and insatiable in the acquisition of knowledge, the ever conspicuous power and faculty of learning were demonstrative of his great intellect. Indefatigable as an investigator, utilization of time and opportunity found him ever active in the study and solution of problems presented by the various natural sciences to which his life was dedicated.

The eagerness with which he engaged in study, a conspicuous characteristic, is illustrated by the following incident that occurred when a mere youth: Visiting the Philadelphia Academy of Natural Sciences, he stood before a locked cabinet containing specimens in which he was deeply interested, and being unable to handle and examine them, his disappointment found expression in tears. The great Leidy passed by and, noticing the distress of the youthful Wood, inquired the cause. Being informed and doubtless recognizing the impulses of genius, he had the cabinet unlocked and the specimens placed at the student's disposal.

Dr. Wood was an enthusiastic student of botany. In 1860, when but nineteen years of age, he presented his first scientific paper, Contributions to the Carboniferous Flora of the United States. From then until 1873 fourteen papers, each of which was an authoritative classic, appeared in the *Proceedings of the Academy of Natural Sciences*, *American Philosophical Society*, *Quekett Microscopical Club Journal*, *American Journal of Science* and the *Smithsonian Institute*. In 1872 the Smithsonian Institute published Dr. Wood's monograph *The*

Fresh Water Algæ of North America. This paper contained nineteen colored and two uncolored plates prepared from 360 original microscopic drawings which for accuracy of detail and perfection are unsurpassed. It remained the authoritative work on this subject for twenty-five years.

The following botanical papers may be mentioned as demonstrating Dr. Wood's phenomenally acute powers of observation: *Life History of Some Siphonaceous Fresh Water Algæ*; *Manner in Which Schizomeris Leibleinii Produces Its Zoospores*; *New Species of Desmids*; *New Species of the Genus Siroisiphon*, the *S. lignicola*, *S. phloiophilum*, *S. disjunctum*.

Entomology also engaged his attention during these years, and his achievements in this branch of science culminated in fourteen papers characterized by that thoroughness and masterful research which stamped each as an authoritative contribution and an acquisition to knowledge. Of these studies, which want of time prevents naming, that entitled *The Myriapoda of North America* was published in the *American Philosophical Society Transactions* in 1865. It was a brochure of 112 pages—with sixty-one figures in the text and three plates. The drawings, true to nature, were exponent of his skill. The excellence and reliability of his work was recognized by Louis Agassiz, who in 1865 headed a large naturalizing expedition to Brazil and after his return wrote the following letter to Dr. Wood:

DEAR SIR:

While in Brazil I have collected a good many myriapods in every part of the Empire visited and I will gladly put the whole at your service as soon as the specimens can be picked out, but I cannot say how soon this will be possible as I cannot make a beginning with the arrangement of my collections before I can secure the means of buying about 5,000 gallons of alcohol to carry the work through.

Very truly yours,

AGASSIZ.

Dr. Wood was an indefatigable worker. He would frequently concentrate his mind upon the subject in hand for thirty consecutive hours, then relax and indulge in uninterrupted sleep for from twelve to eighteen hours, when his insatiable thirst for knowledge found him again active in the pursuit of investigation and discovery, with that intensity of interest and painstaking care in observing the minutest details which crowned his labors with phenomenal success. Profound learning necessarily established a high plane from which to observe conventional standards of achievement, enabling Dr. Wood to enter his chosen profession of medicine with a mind exceptionally well informed and an intellect of superior power.

As professor of botany in the auxiliary medical course of the University of Pennsylvania, his ability as a teacher was highly cultivated, and later his occupancy of the chair of materia medica and therapeutics in the major faculty of medicine constituted one of the strongest and most influential of the then famous centre of medical education. He was a brilliant and impressive lecturer and a teacher of great renown.

His career in the natural sciences rendered him extremely alert in recognizing the inevitable consequences of cause and effect. He was painfully con-

scious of the imperfections and limitations of empirical medicine, and the measure thereof found expression in the fearless manner in which, then almost single handed, he entered the arena in a struggle having for its aim the establishment of physiological or rational medicine upon a firm and scientific basis. With an open mind ever alert to recognize and acknowledge truth, he did not belittle the knowledge of means to end that empirical medicine had established, but sought to add thereto elucidation and explanation. His sincere willingness to entertain and accept demonstration of mistake or error was parallel with his eagerness and desire to guide and instruct and guard against error wherever and whenever encountered, and the measure of his true greatness.

To Professor Wood belongs the distinguished honor of having been a pioneer in establishing the epoch of rational medicine. The courage of conviction that found him alone championing rational medicine, therapeutics based upon knowledge and logical conclusion, was conditioned upon his recognition of the defects of empirical medicine. From the first edition of his epochmaking treatise on therapeutics, published in 1874 and antedating that of Lauder Brunton by ten years, of which fourteen editions were printed and served as a model for textbooks on therapeutics in European countries as well as the United States, the following quotations from the preface serve to emphasize the firm foundation upon which he stood: "There are a number of excellent treatises upon materia medica and therapeutics, yet in various attempts at original research as well as in the ward and lecture room of the hospital I have keenly felt the want of something more. The old and tried method in therapeutics is that of empiricism or if the term sounds harsh, of clinical experience. The best possible development of this plan of investigation is to be found in a close and careful analysis of cases before and after the administration of a remedy, and if the results be favorable the continued use of the drug in similar cases. That very much has been thus accomplished it were folly to deny. Therapeutics developed in this manner cannot rest however upon a secure foundation. Looking at the revolutions and contradictions of the past, listening to the therapeutic Babel of the present, is it a wonder that men should take refuge in nihilism and, like the lotus eaters, dream that all alike is folly—that rest and quiet and calm are the only human fruition? A primary knowledge of the end to be accomplished, and a secondary acquaintance with the instruments are a necessity for human effort and until the sway of this law is acknowledged by physicians, medicine can never rise from the position of an empirical art to the dignity of applied science. The work of the therapist is with the second portion of the law. Evidently, it is his special province to find out what are the means at his command, what the individual drugs in use do when put into a human system." Thus did this champion and pioneer of rational medicine enter the arena of controversy and withstand the attacks of relatively ignorant and emotional antagonists who sought by all means available, social, financial and political, to

prevent scientific investigation and the establishment of the era of rational medicine.

Animal experimentation was a *sine qua non* which was most bitterly opposed. No less an authority than the famous Niemeyer, an authority however in another sphere, asserted that experiments made with medicaments upon lower animals or upon healthy human beings have as yet been of no direct service to our means of treating disease, and that a continuance of such experiments gives no prospect of such service. The antagonists asserted that medicines did not affect lower animals as they did human beings. Apparently the contention was well taken, but Dr. Wood demonstrated that while apparently this was true, in reality it was erroneous and a misinterpretation. He proved that while it required as much morphine to kill a pigeon of a pound weight as to destroy a man, it was not a different action but on the contrary an identical one, the seemingly different effects being dependent upon varied degrees of susceptibility, and that the *modus operandi* was identical. This physiological law or truth Dr. Wood further demonstrated by a study of atropine. An animal which may be exceedingly sensitive to the spinal action of atropine in contradistinction to that of its effects upon the conducting fibres, the nerve trunks, will result in convulsion on the one hand and paralysis on the other. This law makes understandable why so many drugs seemingly exert an antagonistic action. Dr. Wood, by conclusively demonstrating that degree and quality are two separate and distinct things and should never be confounded, successfully combatted the efforts of ignorance and emotionalism to make it a crime to pursue scientific research. What may properly be designated the *opus major* of Wood, the achievement of having instituted an epoch in medicine characterized by the relinquishment of the empirical and the adoption of the rational and of establishing an era conspicuous for achievements in preventive as well as curative medicine, is of itself sufficient to place his name side by side with those of the immortal Hippocrates, Galen, Sydenham, Hunter, Lister, Laennec, Jenner, Pasteur, and Koch.

In 1810 Majendie, studying the effects of nuxvomica, recognized the vital importance of knowing how medicines affected the human system, but to Horatio C. Wood belongs the credit of having brought to the recognition of the medical world the necessity of adopting rational medicine as the one essential means of acquiring that skill and art in the prevention and treatment of disease upon which humanity depends.

Dr. Wood consecrated himself to medicine. In 1869 he made his famous experiments upon himself with American grown cannabis, the details of which appear in his work on therapeutics. The following year his first paper on the Physiological Action of Drugs was published in the *American Journal of the Medical Sciences*. His studies of the action of veratrum viride led to its adoption in practice by clinicians generally. In 1871 Dr. Wood's papers treating of the physiological action of amyl nitrite were published. Two years previously Lauder Brunton published his paper which set forth the value of amyl nitrite in angina pectoris, but the

contribution of Dr. Wood was the first description of the physiological action of the drug upon the nervous system. His investigations of chloroform, ether and other anesthetics are so well known that mention only is necessary. These results were published in 1890 and the following year found him honored with being selected to make the principal address before the general session of the International Medical Congress (at Berlin). These studies have probably been responsible more than the work of any other scientist for the general adoption of ether as an anesthetic by the entire surgical world. It was while pursuing the studies of anesthetics and the treatment of their toxic effects that Dr. Wood discovered the value of strychnine as a respiratory stimulant and its importance in averting threatened death.

Of 5,000 scientists present at the Berlin Congress the Duke of Bavaria, a physician, selected and entertained twenty-five who were noted for exceptional achievements. Of these Professor Wood was one and when about to be seated the Duke removing his crown placed it upon Dr. Wood's head and further honored him by requesting him to occupy the chair *pro tem*. Thus Professor Wood was Duke of Bavaria for almost an hour.

In 1903 Dr. Wood represented the United States Government at the International Conference held at Brussels for the purpose of unifying the more important preparations of the various *Pharmacopæias*. Early in its session this conference became so involved in an acrimonious dispute as to the proper percentage of alcohol to be used in making tinctures that the whole usefulness of the meeting was seriously threatened. Dr. Wood, by his personality and well known advocacy of justice and right, succeeded in convincing the delegates of the foolishness of quibbling over minor details and they finally adopted the present regulation for ten per cent. tinctures and various other standards which are recognized by the *Pharmacopæias* of practically all civilized nations. This busy clinician, investigator, teacher and author published his textbook on *Nervous Diseases and their Diagnosis* in 1887.

Of 240 medical papers each one of which was a classic and an addition to the knowledge of the science and art of medicine, the treatise on thermic fever or sunstroke has especial value. Published in 1872, it was accorded the Boylston Prize. What this work has contributed to the saving of thousands of lives annually, is testimony of one of the great services this man of genius has accorded to many. His investigations of fever culminated in a work of 250 pages which was published by the Smithsonian Institute in 1880. It is a monument to his learning and a most valuable contribution to medical science. Dr. Wood discovered the alkaloid hyoscyne while studying the effects of hyoscyamine and in 1885 demonstrated its value for certain nervous diseases.

His researches in experimental pharmacology, physiology and pathology embody more than fifty contributions to the science and art of medicine. Twelve conscientiously elaborated subjects of medical jurisprudence and toxicology were contributed from the years 1873 to 1899. As a clinician, his studies of pathology, medicine and therapeutics

comprise 139 papers which for originality and profundity of learning are invaluable. Thirty-six published lectures and addresses appeared in various journals during the years 1874 to 1900 and extended his beneficial influence throughout the continent.

Nine magazine articles from the year 1872 to 1879 brought to the lay mind information and knowledge which proved of great value in securing popular cooperation with efforts instituted by the profession for the betterment of standards of medical efficiency. In 1875 there appeared in *Lippincott's Magazine* an article contributed by Dr. Wood entitled Medical Education in the United States. This paper brought to a crisis the agitation which had been active for many years concerning this matter, which was and is of such vital importance to the profession of medicine as well as the greatest and highest interests upon which human welfare is conditioned. It caused radical changes in the medical department of the University of Pennsylvania, and indirectly compelled other colleges of medicine to reform their curricula. It advocated State Board examinations and was a powerful influence for the establishment of the legal supervision of the qualifications and rights to practice the healing art.

In 1889 Yale University conferred upon Professor Wood the degree of LL.D. The occasion was made an opportunity by Dr. Wood to use his influence in promoting and intensifying interest in higher medical education. The title of his address, The Medical Profession, the Medical Sects, the Law, emphasized the necessity of demanding for the doctorate men of proper preliminary education and the administration of an ample curriculum. The too commonly encountered unfitness of clinicians upon whom colleges had conferred the medical degree and the fearful consequences he emphasized by the astounding statement that the horrible disasters of the Johnstown flood were insignificant when compared with those resulting from the ill prepared and unqualified practitioner. So strongly was Dr. Wood convinced of this seriously defective but then prevalent system of medical education that the comparison was unhesitatingly presented to the interested audience with that vehemence which always characterized his advocacy of higher ideals.

It is the habit of action that individualizes man and imparts special qualities to his character. That "nature never rhymes her children nor makes two men alike" is a fact that explains why men of genius constitute a centre from which emanate influences for either good or evil which powerfully modify the lives of all within their range. That Dr. Wood was keenly alive to this great truth is made manifest by his definition of character: "Character is the established equilibrium existing between the emotional, the intellectual and the volitional." To establish and possess that equilibrium is an achievement which few attain. It taxes to the utmost the noblest and best qualities with which a man is endowed, and that Dr. Wood was ever alert to so do was evidenced by his every action. Once while in conversation he suddenly stooped down and caught a large roach that was crossing the floor and, holding it in his hand, fondled it. Being asked why, his reply was that to master a foundationless dislike of

anything harmless was invaluable and when it caused one to overcome empty prejudices it contributed to the usefulness of being and did much to give force to one's influence for the betterment of fellow man.

Dr. Wood was profoundly conscious of the value of time, and as a superficial glance into his active life shows, every moment was advantageously occupied. As an example of untiring and continual work he stands preeminent, and the fundamental principles underlying his achievements are well shown by the subject of his inaugural address before the trustees, faculty and student body of the University of Pennsylvania when as professor of materia medica and therapeutics his wonderful career in that capacity began. He urged upon every one that a definite object in life is the goal for which to strive, and that substantial progress is conditioned upon a thorough mastery of each involved factor. In that manner by which he had the happy faculty of impressing great truths upon the minds of his pupils, he drove home these principles by quoting from *Mother Goose*, how "leg over leg the dog got to Dover," and all who were privileged to hear him proclaim that the dream of his life was to become a professor and that by a conscientious mastery of minute and upbuilding details the goal was reached, were doubtless stimulated to emulate the great teacher and strive to do their best.

As Emerson so impressively states, character is the moral order seen through the medium of an individual nature. An individual is an enclosure. Time and space, liberty and necessity, truth and thought are left at large no longer. All things exist in the man tinged with the manners of his soul. With what quality is in him he infuses all nature that he can reach, nor does he ten to lose himself in vastness. He animates all he can, and he sees only what he animates. He encloses the world as the patriot does his country, as a natural basis for his character and a theatre for action. A healthy soul stands with the just and the true as a magnet arranges itself with the pole, so that he stands to all beholders like a transparent object between them and the sun, and who journeys toward the sun journeys toward that person. He is thus the medium of the highest influence to all who are not on the same level. Thus men of character are the conscience of the society to which they belong. To the honor and memory of the first president of the American Therapeutic Society may be ascribed the consummation of a life conspicuous for moral, intellectual and physical excellence, the influence of which for betterment will continue on and on. His example will ever serve the thousands whom he influenced as a guide and stimulus for right living and constitute a power for good in the uplift of humanity as enduring as time.

Analysis of Blood of Insane Patients.—Paul G. Weston (*Archives of Neurology and Psychiatry*, February, 1920) states that the blood of epileptic, dementia præcox and manic depressive patients shows no deviation from the normal content of total nitrogen, nonprotein nitrogen, uric acid, urea, creatinin, creatin, glucose, chlorine or calcium.

EVOLUTION OF MODERN MEDICINE LEADING TO GROUP DIAGNOSIS.

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In reviewing the evolution of modern medicine three periods are noted:

1. Ancient: a, Prehistoric medicine before Hippocrates; b, classical or Greek and Roman medicine, 460 B. C. to 476 A. D.

2. Medieval: a, 476 A. D. to Paracelsus, 1493; b, philosophical medicine, 1493 to Pasteur, 1822.

3. Modern or scientific medicine, 1822 to the present.

The earliest historical fact in the healing art is that it was in the hands of the priests attending in the temples of certain deities. The earliest known physician lived in the third Egyptian dynasty about 4500 B. C. He had a temple erected in his honor on the Island of Philæ and was worshipped at Memphis. Engravings depicting surgical operations, dated about 2500 B. C., have been found, and also a vase of an Egyptian Queen of the eleventh dynasty containing dried drugs. In the edicts of Hammurabi, 2500 B. C., there are regulations for medical practice, rewards for success and punishment for failure. The first known surgical instruments were copper knives found in a tomb near Thebes, dating from about 1500 B. C. It is interesting to note how medicine was practised then in the different localities.

ANCIENT MEDICINE.

Egyptian Medicine.—The Egyptian physicians appear to have been specialists. According to Homer, they were particularly skillful in compounding drugs. They were familiar with the use of castor oil, opium, colchicum, gentian, squill and other drugs, which they usually compounded with excreta, blood, etc. The physicians were divided into three classes, as follows:

1. The lower class or military physicians.

2. The next upper class were the Pastophora, who studied the last six books (Hermatic) dealing with anatomy, pathology, pharmacy, ophthalmology and gynecology.

3. The highest class of physicians were the sages or soothsayers, who acquired their learning from the thirty-six Hermatic books of Thoth.

Models in gold or silver of the diseased parts (anathemata) were given by sufferers to priests who hung them before shrines, and later sold them to other invalids. Medicine as practised those days was largely sacerdotal.

Babylonian Medicine.—The people of Babylon were their own physicians, bringing all who were sick to the market place, where every passerby could stop and express his opinion, diagnose, and treat the case. Later on came the physician priest. Nearly every disease was attributed to the liver, and medicines were given internally to dispossess demons.

Jewish Medicine.—The sources of this knowledge are the Bible and Talmud. The Jews excelled

in anatomy and hygiene. They advocated the earliest operation of circumcision, and also described bubonic plague and syphilis. Medical education among the ancient Hebrews was very progressive.

Medicine of the Hindus.—This is a history of elaborate error. The Hindus, however, excelled in surgery, their cataract operation being used today. Susruta in the fifth century attributed the cause of malaria to the mosquito.

Chinese Medicine.—Medicine in China is the essence of conservatism. It has been practically stationary for thousands of years, and is now about on the level of European medicine in the thirteenth century. The Chinese still believe that the larynx opens up into the heart, the spinal cord into the testicles, and that the spleen and heart are organs of reason.

Japanese Medicine.—In medicine as in other sciences Japan has shown a remarkable capacity for assimilating European knowledge. Before 96 B. C. all her medical science was superstition and mythology. From that time to 700 A. D. it was that of the Chinese, when she began gradually to absorb outside ideas and to keep pace with European medicine.

Ancient Greek Medicine.—Medicine of ancient Greece is supposed to have originated with Æsculapius, the god of medicine among the Greeks, subsequently adopted by the Romans and usually said to have been a son of Apollo. He was worshipped in particular at Epidauris in Peloponnesus, where a temple with a grove was dedicated to him. The sick visiting his temple had to spend one or more nights in the sanctuary, after which remedies to be used were revealed in a dream. Those who were cured offered a sacrifice to Æsculapius. There were two sets of physicians of the temple, i. e., those who were priests of Æsculapius and Æsclepiadæ, who were physicians but not priests and who learned medicine from their fathers or foster fathers.

Pythagoras (580-489 B. C.) founded the school of philosophers in Crotona, where he was driven from Samos by the tyranny of Polycrates. He was the first to suspect the functions of the brain, and devised a system of numbers in diagnosing diseases, namely, unity as the symbol of God and perfection, and twelve for the universe. This he applied to abnormal conditions for comparison. Then came Plato and Aristotle, who taught four principles or qualities—heat, dry, moist, and cold, and formulated them as follows: Heat plus dry equals fire; cold plus dry equals earth; heat plus moist equals air; cold plus moist equals water. From these arose the humoral pathology of Galen, the basis of which was that the body was made up of four humors: blood, phlegm, yellow bile and black bile, i. e., heat and moist equals blood; cold and moist equals phlegm; heat and dry equals yellow bile; cold and dry equals black bile.

THE CLASSICAL PERIOD.

The classical period began with Hippocrates, 460 B. C., and lasted to the fall of the Western Empire in 476 A. D. Hippocrates was born on the Island of Cos. He was one of the family of the

Æsclepiadæ and the contemporary of Socrates and Plato. He was educated by his father Herocles and by Hiradicus. He was the real father of medicine. His methods were similar to those of the modern practitioner, and his description of diseases is still of value. He was the first physician to commit his teachings to writing, and therefore was the father of medical literature. His great achievements were the writing of the Hippocratic oath and the description, known as the Hippocratic facies, of one approaching death. He wrote on prognosis, epidemics, diet in acute disease, wounds of the head, air, water and place. He also wrote medical aphorisms and described tuberculosis, puerperal convulsions, mumps, and epilepsy. He observed the pulse, temperature, respiration, facies, sputum, pain, and movements when predicting the outcome of a case. His great merit lay in the fact that he believed in giving nature her chance, and dispensed with drugs as far as possible. He relied chiefly on fresh air, good diet, purgation, tisanes of barley, wine, massage, and hydrotherapy. His clinical histories were the only ones for 1700 years. His other great achievements were: First, the separation of medicine from theurgy and philosophy; second, the making of a connected and symmetrical science from a mass of disconnected teachings; third, the exercise of a beneficial, moral influence upon the practitioner of his time. After Hippocrates there were no great medical teachers until Aristotle, whose contributions to medicine were studies of comparative anatomy, embryology, and formal logic. He named the aorta and probably had an accurate idea of the function of the blood. The empirical school of medicine flourishing then rejected all etiology and anatomy and laid weight on the empirical tripod: 1, History of the particular case; 2, its analogy to similar cases, and 3, its accidental surroundings.

Roman Medicine.—Before Galen, Roman medicine was a riot of theories. Thus, Asclepiades of Bithyma, 124 B. C., believed in a relaxed or constricted state of the body, or solidism, as a cause of disease. Celsus wrote on malarial fever, gout, and insanity. Dioscorides is said to have originated the *materia medica* and Arctacus ranked next to Hippocrates as a clinician and writer. His accounts of pneumonia, diabetes, lockjaw, elephantiasis, and diphtheria are classical. Galen (131-201) was one of the greatest physicians in ancient medicine. He believed that disease was abnormal and that health might be conserved by the upbuilding of the body. He believed in the four humors mentioned above, and was a great user of drugs. He was an anatomist and an experimental physiologist, and described the infectious character of tuberculosis, treating it with fresh air, change of climate, and good diet. He also described and recognized the distinction between pleurisy and pneumonia, and described aneurysm. But he also believed in the efficiency of amulets, the doctrine of vitalism, i. e., that the blood received natural spirits from the liver, vital spirits from the heart, animal spirits from the brain, and that the blood poured from the right heart into the left through invisible pores; that pus served a good purpose in wounds. He was

the originator of the famous anodyne necklace which was so long used in England. These errors were hardly questioned for about 1500 years. He was also a voluminous writer on medical and philosophical subjects; very interesting were his writings on Anatomical Administrations and the Use of the Parts of the Human Body. He was also a practical dissector of lower animals. Quackery was rampant in Rome because the Roman citizens were not encouraged to study medicine. Many slaves became doctors. The *Servi Medici* were doctors who were prisoners but had to serve in their professional capacity.

MEDIEVAL MEDICINE.

There was but little progress made in medicine during the middle ages, as Galen seemed to have said the last words on the subject, and most of the writers compiled from his works. The Byzantine Empire produced four medical writers, Aribasins (326-403), who wrote an encyclopedia of over seventy volumes; Ætius of Amida (sixth century), wrote well of disease of the eye, nose, mouth, and teeth; Alexander of Tralles (526-605), wrote on worms and vermifuges, and Paul Ægineta wrote an epitome of medicine in seven books.

Arabian Medicine.—Rhazes (860-932), a physician of the Eastern Caliphate, gave the first authentic account of smallpox and measles. Avicenna (980-1037), wrote the *Canon*, a system of medicine in which theorizing took the place of experimenting. The most renowned physicians of the Western Caliphate were Avenzaar, who described the itch mite and was the first parasitologist, and Moses ben Maimon, who wrote a book on hygiene. They described the heart as the prince of the body; the lungs as the fan of the heart; liver as its guard and habitat of the soul; pit of the stomach as the seat of pleasure; and gallbladder the seat of courage. Their hospitals were excellent. The Alman-sur Hospital at Cairo perhaps surpassed many present day institutions in its humanitarian practices.

Jewish Medicine.—At this time Jewish medicine was just like Arabian. The ancient Hebrews were banished in 1412 from the Western Caliphate, and were not allowed to study medicine at European universities until the time of the French revolution. In spite of that, much of the progress from hypothetical to scientific medicine was due to this race.

The famous medical school at Salerno arose from a little health resort. The school lasted several centuries, after Robert, son of William the Conqueror, was treated successfully for a wound in the head, in 1101, and was abolished by Napoleon in 1811. The ceremonies used for conferring medical degrees at Salerno are copied even today. The degree of doctor of medicine was conferred upon the graduates of Salerno by Gilles de Corbeil in the twelfth century.

Other great schools were at Palermo, Naples and Montpellier. Toward the close of the medieval period medical science began to free itself from the doctrines of Galen, and received the benefit of some independent thinking. The leader of the intellectual revolution was Henri de Mondeville

(1260-1320), who advocated clean surgery, and in a measure was the first asepsist. In 1140 Roger of Sicily formulated some admirable hygienic regulations. In the middle of the fourteenth century a series of epidemics, such as leprosy, St. Anthony's fire, scurvy, influenza, and bubonic plague, ravaged Europe. It is estimated that about one quarter of the earth's inhabitants or over 60,000,000 people perished in a period of two years. Syphilis appeared in Europe in 1495 at the siege of Naples.

PHILOSOPHICAL MEDICINE.

Superstition still reigned during this period, and what is known as signatures was practised, i. e., using drugs that have a resemblance to a disease to treat it; for instance, yellow plants for jaundice; red ones for anemia; trefoil for heart disease; thistle for a stitch in the side; walnuts for diseases of the head, etc. Paracelsus (1493-1541), whose real name was Van Hohenheim, was the earliest prominent physician of this period. He boldly attacked Galen, Avicenna and others, publicly burned their writings and prepared the way for modern medicine. He was the only asepsist between Mondeville and Lister. He wrote also on occupational diseases, cretinism and goitre, and lectured in his native tongue, a startling innovation not repeated for over three hundred years. Thomas Linacre (1460-1524) established the medical department of the universities of Oxford and Cambridge. Due to his influence Henry VIII made it obligatory for candidates to pass examinations in medicine to secure a degree from one of the universities. Andreas Vesalius (1514-1564) was the first great anatomist, and published *De Fabrica Humana Corporis*, the first anatomy worth its name. He ridiculed Galen's description of the heart, taught artificial respiration, and held that the brains of lower animals functionated the same as man's. Two of his pupils became famous: Fallopius (1523-1562), who named the Fallopian tube, and Eustachius (1524-1603), who named the Eustachian canal. Vesalius through anatomical drawings hinted at the circulation of the blood, and Servetus (1509-1553) also suspected it.

During the sixteenth century much progress was made in medicine. Andreas Cesalpino (1524-1603), an Italian, formulated a theory closely approximating the true circulation of the blood, later proved by Harvey. The famous Bedlam Asylum was started in 1547. Leprosy, cholera, and sweating sickness practically disappeared from Europe by the middle of this century, syphilis and bubonic plague remaining.

The greatest physician of the seventeenth century was Harvey (1578-1657), who discovered the true circulation of the blood. His other great contribution to medicine was his theory of generation that overthrew the ancient assumption that life was derived from a sort of putrefaction. Although he stated that the heart was a muscular force pump, he did not know its source of power, and attributed it to innate heat, celestial in nature and identical with the essence of stars. Later, Malpighi (1628-1694), with the aid of the microscope, discovered how the terminations of the arterial and venous blood vessels empty into each other, and he supplied

the last link to Harvey's chain. Thomas Sydenham (1624-1689) and John Garut, who published the first book on vital statistics, were great physicians of that day. There was still much superstition in medicine and materia medica, which had reference to worms, dried vipers, fox's lungs, powder of jewels, moss from the skull of a murdered man, crab's eyes, oil of bricks, etc. Charles II gave \$50,000 for the formula of Goddard drops recommended by Sydenham, made from raw silk.

The eighteenth century was filled with systems and theories. George E. Stahl (1660-1734) wrote on the liver and tear duct and on a theory of an imaginary component of the body he called phlogiston, which he considered necessary to all vital processes. Herman Boerhaave (1668-1738), the greatest physician of the eighteenth century, was the first to prove that smallpox was contagious and that pleurisy was confined to the pleura. Morgagni (1682-1771) when seventy-nine years old published a work which proved to be the basis of modern pathology. Sir John Floyer (1649-1734) timed the pulse rate with a one minute watch. Dr. G. Martini (1702-1741), a Scotchman, discovered the clinical thermometer. Dr. Van Haller was noted for his surgical treatment of aneurysm. Dr. Auenbrugger (1722-1809) introduced percussion of the chest as a means of diagnosis. Toward the end of the eighteenth century came Dr. Jenner's great discovery of vaccination, a preventive against smallpox. The hospitals of the eighteenth century were kept so filthy that operation practically meant death. There was really no clean surgery until Lister's time, and no humane treatment for the insane until William Turke, in 1793, started the Yorke treatment. The charlatans of the eighteenth century were numerous and picturesque. The most notorious were Sir William Reed, known as Spot Ward, and Joanna Stevens.

About 1800 the Royal College of Surgeons was incorporated, connected with some of the hospitals in London, as Guy's, St. Bartholomew, St. Thomas, and St. George at that time were medical schools, in which the teachers were the attending physicians and surgeons of the respective hospitals. Scotland antedates England in the matter of medical education. The medical school of St. Andrews was founded in 1411, and that of the University of Edinburgh in 1582.

The first half of the nineteenth century was largely a continuation of the theorizing of the eighteenth century; the chief progress was made by the French physician Francois Victor Broussais (1772-1838), whose theory was that disease was caused by too much heat concentration on one particular organ. He bled his patients profusely, so that France in 1883 imported over forty-three million leeches. Soon after Lewis proved through statistics that leeches were harmful, and this practice was stopped. He was the founder of medical statistics. Parkinson (1755-1824) reported the first case of appendicitis in England, and gave his name to paralysis agitans. Laennec (1781-1826) invented the stethoscope and in 1823 wrote a textbook on thoracic diseases. Pinel (1745-1826) risked his life

for the insane, who up to this time were treated worse than criminals. Pelletier and Conventon discovered quinine in 1820, and thereby malaria was cured. The greatest English clinician of that day was Dr. Richard Bright (1789-1858), who distinguished between the various forms of kidney lesions and classified kidney diseases, a classification which is used even today by such great clinicians and surgeons as the Mayos. Kidney disease is commonly known as Bright's disease ever since his writings on this subject. Thomas Addison (1793-1860) wrote a monograph on the local and constitutional effects of disease of the suprarenal capsules, and opened the field for the study of the ductless glands and their internal secretions. Semmelweis (1818-1865) and Oliver Wendell Holmes (1809-1894) discovered the true cause of puerperal fever. S. C. F. Hahnemann (1755-1843) founded a new cult called homeopathy, on theories akin (intellectually) to the doctrine of signatures, the first tenet being that "like cures like," a generalization dating back to 650 B. C. The second tenet was that infinitesimal doses should be given which were supposed when shaken violently to develop mysterious powers—probably to correct a defect in those days of overdosing patients with drugs. Hahnemann claimed divine inspiration. It had an immense vogue for a number of years. Homeopathy of today has departed widely from the original teachings of the founder. John Hunter, a British surgeon and physiologist, in 1760 wrote on the blood, inflammation, and gunshot wounds. His museum contains wonderful anatomical and surgical specimens now with the Royal College of Surgeons. William Hunter (1718-1783), an older brother, wrote an *Anatomical Description of the Human Gravid Uterus and Its Contents*. He was an obstetrician.

SCIENTIFIC MEDICINE.

Scientific medicine began about the middle of the nineteenth century. It was about this time, 1845, that Darwin and Wallace promulgated their views on evolution. Magendie (1783-1855) was a pioneer in experimental physiology; Schleiden (1804-1881) and Schumann (1810-1882) developed the knowledge of cell growth. Rudolph Virchow (1821-1859) began in 1847 the publication of *Archiv für pathologische Anatomie*, now *Virchow's Archives*. His first number took a stand against improved hypothesis and the infallibility of any one man, thus striking the keynote of modern medicine. In 1858 he published a book on cellular pathology, with which began the European period of modern medicine. His famous epitaph was *omnis cellule e cellula*; that is, where there is growth of cells there must have been cells preceding them. Henle (1809-1885) was one of the greatest anatomists of all time. In 1840 he published his observations which were the nucleus of the germ theory of disease. Louis Pasteur (1822-1895), who was originally a chemist, was the father of bacteriology. The whole field of preventive inoculations is due directly to him, and he is credited with discovering the preventive treatment of hydrophobia. Emil von Behring in 1894 discovered diphtheria antitoxin. Asepsis and antisepsis in surgery was

the epoch making work of Lister (1827-1912), and due directly to Pasteur's teachings. Claude Bernard (1813-1878), the leading physiologist of the century, discovered the glycogenic function of the liver, which proved that the body could build up or break down substances itself. Von Baers (1792-1876) discovered the mammalian ovum, and did for embryology what Cuvier did for anatomy—made it comparative. Von Friedreich in 1857 was the first to describe acute myelogenous leucemia. Friedlebens in 1858 in a monograph, *Die Physiologie der Thymusdrüse*, described the thymus gland perfectly. Hubner wrote on endarteritis in 1874. Cannon, Harvey, and Cushing of America, and Pavlov of Russia continued along lines laid down by Bernard Laveran in 1881, who discovered the malarial parasite. Robert Koch in 1882 discovered the tubercle bacillus and formulated the Koch postulates to prove a germ disease. Schaudinn in 1905 discovered the *Spirochæta pallida*; Wassermann, Neisser, and Bruck in 1906 discovered the serum diagnostic Wassermann test; Plaut in 1908 tested the spinal fluid for the Wassermann reaction. Ehrlich (1854-1919) did an immense amount of work on metabolism, and promulgated and theorized the side chain theory of disease. After a series of experiments he discovered, in 1909, salvarsan or 606 for the treatment of syphilis, and later on neosalvarsan. His pupil Abderhalden in 1877 studied metabolism and evolved the biochemical test for pregnancy. Swift, Ellis, and Byrnes in 1912 perfected salvarsanized serum and treated nervous syphilis by injecting salvarsan directly into the spinal canal. Quincke in 1891 described the technic of lumbar puncture; and cytodagnosis of the cerebrospinal fluid, as described by Ravaut, Siccard, Nageotti, and Widal, in 1901, was classical. In 1903 they described the albumin significance of the cerebrospinal fluid. Roux and Metchnikoff in 1903 experimented with the transmission of syphilis to apes. In 1904 Alzheimer wrote on the histopathology of brain syphilis. Noguchi and Moore found spirochetes in brain tissues of paresis in 1913, and Lange described the gold-sol test in 1913.

Anæsthesia.—Crawford W. Long, of Georgia, in 1842-43 used ether in several cases. Horace Wells, a dentist of Connecticut, in 1844 began the use of laughing gas or nitrous oxide, and communicated this to his friend, W. T. G. Morton, who later experimented with it and with the aid of J. C. Warren and H. J. Bigelow, made the discovery known to the medical profession. In 1831, Guthrie, Liebig, and Soubieran introduced chloroform, purified and named by Dumas in 1834, and used by Sir J. Young Simpson (1811-1870) in 1847 in obstetrics. Cocaine was first isolated by Niemann in Wohler's laboratory in 1858, but not used in medicine until 1884, when Carl Coller called attention to its advantage as a local anesthetic. The discovery of anesthesia revolutionized surgery, and as Weir Mitchell remarked, it was the death of pain. Hypodermic injection for the relief of pain was first administered and introduced to the profession by Francis Rynd, of Dublin, and Dr. Provaz in 1845-1852. The laryngoscope was first used by V. von Bruns in 1862.

Poiselli in 1828 introduced the first U tube mercurial manometer, and shortly afterward Ludwig devised the kymographion, which connected directly to an open artery, recording the pulse wave on a revolving cylinder. Dr. Marey in 1876 originated the first useful blood pressure apparatus or sphygmomanometer by which he could determine both the systolic and diastolic blood pressures and the pulse pressure. Riva-Rocci in 1896 devised the first sphygmomanometer with cuff arrangement as used at the present time, only the cuff was too narrow and gave rise to various modifications for greater accuracy and better results. This led to the discovery of the electrocardiograph, a great aid in the diagnosis of abnormal conditions of the heart.

Electrotherapy was first used in modern medicine by Duchenne. The x ray was discovered by Dr. William Conrad Röntgen in 1893. Mental medicine was in a chaotic state until Emil Kraepelin in 1856 brought order into its study. Sigmund Freud in 1895 promulgated a new psychology known as psychoanalysis. His two chief disciples, C. G. Jung and Alfred Adler, started schools of their own. Alfred Binet and Th. Simon in 1905 and 1908 devised tests for measuring the intellectual capacities of children. Goddard, Yerks, Fernald, and Healy did similar work in America. In 1856 Sir William H. Perkins obtained aniline dyes from coal tar products and marked the beginning of the manufacture of phenacetin, acetanilid, and similar drugs.

In 1910 R. G. Harrison demonstrated that nerve cells could be preserved and grown outside of the body. Then Alexis Carrel proceeded to preserve other tissues outside of the body, and even transplanted organs and limbs from man to man. He also did wonderful work of this kind during the world war, and where these astonishing feats will end it is indeed difficult to say. Dr. G. W. Crile elaborated the theory of anociassociation or blocking of harmful stimuli, and hence preventing shock during operations. He accomplishes this by administering local and general anesthesia together with psychological handling before operating. Sir William Osler (1839), Canadian by birth, was a good clinician and teacher whose works here were similar to Strumpell's in Europe. He added much to medical science through his admirably classified *Practice of Medicine*. Dr. Abraham Jacobi was a pioneer in American medicine, and well deserves the name of the Nestor of American pediatrics. Tinel and Mme. Athenassio Benisty, of Paris, did wonderful nerve repair work during the world war. Carrel and Dakin treated all kinds of wounds and infections successfully with frequent irrigations of chlorinated lime solution named after them. The paraffin and ambrine treatment of extensive burns and surface wounds were developed also during the war and is giving good results. Trench foot, trench fever, and trench nephritis are new conditions for diagnosis brought on by the war.

American Medicine.—The first American medical books were published in Mexico City in 1570-1595. Dr. J. Morgan and William Shippen in 1765 founded the medical department of the College of Philadelphia, known later as the University of

Pennsylvania. In 1767 the medical department of King's College of New York, now known as Columbia University, was founded; the medical department of Harvard University was organized in 1782, and of Dartmouth in 1798. Prior to the establishment of these schools, medical instruction was given by practitioners to their private pupils, except those who studied abroad in foreign medical schools. There was no real American medical literature until after the revolution, when Benjamin Rush (1745-1813) came into prominence. Five medical schools were started in the United States before 1800.

With the rapid expansion of the population in the nineteenth century, it required a much larger number of physicians than the schools supplied. In the absence of restricted law, numerous private schools (medical) were established for profit and gain. A precedent was found in the London medical schools, which were independent of the universities. But in London the medical school was part and parcel of its respective hospital and could not confer a degree. The American medical school had no hospital connection or, in rare instances, an inadequate hospital, and it obtained the right to confer medical degrees, which for many years carried with it the right to practise medicine. Well up into the eighties demoralization was practically complete; in spite of that, medicine and especially surgery made marvelous strides in America in the short time they have been practised here. Much research work, such as animal, bacteriological, pathological, and cellular is being carried on and is constantly adding to progressive medicine new discoveries too numerous to mention. The discovery of anesthesia and most operative technique in surgery is distinctly American. Today America is quite as progressive, if not more so, in many departments of medicine, surgery, and laboratory work, as Europe. The world war has helped greatly to bring together medical ideas of all lands and diffuse this knowledge about evenly in worldly medical events. It will probably be many years before all the new discoveries will be known that were made in medicine during the war.

Medical Education of Women.—The admission of women into medical schools was more bitterly opposed in Europe than in the United States. Until 1900 the medical colleges of Germany were closed to women, and not until 1876 did Parliament pass a bill admitting women into the medical schools of Great Britain; in Paris, in 1871. Now they are permitted to study medicine in Stockholm, Upsala, Madrid, Valladolid, Barcelona, Berne, Zurich, and Geneva. In Russia the war department conducts medical schools for women at Petrograd and Moscow. In the United States in 1848 there was the Boston Homeopathic Medical School for Women; in 1850, the Women's College of Philadelphia; in 1868, the Medical College of the New York Infirmary; in 1870, the Free Medical College for Women. Women now are permitted to study medicine in Johns Hopkins University, the University of Pennsylvania, and Cornell University. In 1911 only two colleges were exclusively for women.

In general, within the past fifty years great prog-

ress has been made in medicine. Undoubtedly in the future preventive medicine will prevail rather than curative, and therefore the subject of diagnosis will be the prominent topic, which we shall describe more fully later.

Practical or applied hygiene and sanitation, physical culture, health education of the laity in matters pertaining to sexual hygiene, the regulation of contagious diseases and inoculations, together with the rising standard of medical education and stricter laws governing practice, will improve the condition of the race until disease will be rare. Many maladies now obscure will be found to be due to one or more perverted functions of the ductless glands, and extracts therefrom will be used. The discovery of infecting agents in such diseases as scarlet fever is only a matter of time. For the past one hundred years experiment has been taking the place of theorizing, and where the early days of medical science present the picture of a few Titans standing out from a background of ignorance, the nineteenth and twentieth centuries show workers in many fields, collecting and collating facts in biology, chemistry, physics, physiology, endocrinology, pharmacology, psychology, accepting nothing as absolute truth, but ever seeking results which shall be truer than former ones, gradually finding out the causes of disease and elaborating a system of preventive medicine which is the hope of the future. Nothing is taken for granted in medicine now; no high flown theorist will be tolerated unless proofs are produced. The patient work of thousands of observant clinicians and painstaking laboratory men is gradually exposing the light of science, and some day empiricism will be entirely eliminated.

Looking ahead as to the possible further development of medicine, it seems to us that the future of this science lies in specialization. Although specialization in the strict sense was not practised in ancient times; still we find a hint of it in the history of Egyptian medicine. Hippocrates also gave definite descriptions of disease and facies, and wrote the Hippocratic oath, his main specialty being dietetics. Dioscorides originated the *materia medica*, and Aëtius was the first real specialist who wrote on diseases of the eye, nose, mouth, and teeth. Later on, as medicine assumed a scientific aspect, it became quite impossible for any one man, no matter how brilliant, to master more than a fraction of the existing field of medicine; specialization therefore became necessary. Among the theoretical specialists we find Gilles de Corbeil, who was the first to confer the degree of doctor of medicine upon graduates of Salerno, in the twelfth century. Roger, of Sicily, was the first hygienist; Paracelsus wrote intelligently on occupational diseases and ductless glands; Henri de Mondeville advocated clean surgery; Vesalius wrote on anatomy; Fallopius as anatomist and gynecologist; Eustachius as anatomist and otologist; Linacre as internist and the first to introduce license examinations to be permitted to practise medicine; Harvey, the physiologist; Malpighi, the great pathologist and microscopist; John Gaunt, the first to write a book on vital statistics, in the seventeenth century; Von Haller, the great surgeon; Auenbrugger, on per-

cussion of the chest; Sir John Floyer, who discovered the pulse rate; George Martini, and the clinical thermometer; Dr. Jenner and vaccination; Turke on care and treatment for the insane; and Lister, who introduced antiseptics and antiseptic surgery. But the more practical medicine began to agree with scientific research, the more specialization became necessary, and in the second half of the nineteenth century division of labor became an established factor in the practice of medicine, bringing forth discoveries from the time of Lister down to the present time.

PRESENT ASPECT OF MEDICAL PRACTICE.

Not so very long ago the family physician was numerically the predominating type of practitioner; at the present time, partly because of the growth of specialization in medicine and partly on account of the great mobility and complexity of our population and of modern life itself, the family physician who treats a particular family continuously and is in close touch with all the members is fast disappearing. Expenses for equipment, x ray laboratory accessories, etc., are too great for the average physician, and health department and commercial laboratories are valuable but limited. This applies not only to equipment but also to the physician's special skill and training. Even those physicians who have had modern training in diagnosis on engaging in private practice often do not have the facilities for using their training effectively for the average patient, or for securing for their patients the services of specialists, because the patient cannot afford their rates. This method of having the patient travel from doctor to doctor or from one specialist to another is used in all classes, but is more prevalent among the well to do and the wealthy. The system is necessarily expensive and is time consuming to the patient, as well as to the physician, who has to be present at the respective consultations at the patient's request, and therefore is not able to work continuously. Besides, the doctor and the patient (separately or together) get independent opinions, often contradictory, and in consequence the physician is frequently at a loss to know the exact diagnosis or how to treat him. This chaotic state of affairs leads the public to seek other means of relief, which accounts for its falling into the hands of charlatans, osteopaths, chiropractors, and other pseudomedical cults. The remedy for that condition is naturally evolving in the form of group medicine practice. The organization of cooperative or group medicine practice is gradually replacing individualism in order to give the maximum of efficiency of equipment and organization of skilled specialists, in order to get correlated medical opinions of trained diagnosticians and as near as possible correct diagnoses of diseases and abnormal conditions.

A number of instances of this tendency are the Mayo Clinics, in Rochester, Minn., the New York Diagnostic Clinics, the Boston Dispensary, and others scattered over the country. These have added valuable data to the medical literature of this century and are in reality institutions for the training of specialists of the highest type, and are also

examples of practical, self supporting pay clinics, diagnosing, correlating data and opinions, and in some cases treating cases and getting results. At the time of the present writing there are about sixty institutions established in America with the group medicine idea. Yet it is not surprising that the real teachers of medicine, the faculties and professors of medical colleges, who should have been the first to advocate any methods that are progressive, fail to recognize this need? It may be expensive to have the proper building, complete diagnostic equipment for every department, and a proper personnel and staff. This may require outside help or large donations, but the group medicine practice plan can be established on a smaller basis with full equipment and trained personnel. Before dwelling on this further, we will define a pay clinic and special dispensary, and then continue with the requisites of a cooperative or group diagnostic medical clinic.

PAY CLINICS.

A pay clinic is one in which a fee is charged to patients, this fee corresponding to the cost of the service rendered. It should therefore be made self supporting. Most of the dispensaries deal with specialty diseases, such as eye, ear, nose, and throat diseases, pediatrics, orthopedics, neurological diseases, etc. The large special dispensaries, existing chiefly in great cities, have contributed substantially to the advancement of specialties in medicine, bringing together a group of physicians or surgeons interested in a particular phase of medical work, and providing excellent equipment for the advancement of special technic.

The essential weakness of a large or small dispensary limited to one specialty consists in an inability to take an all around view of the patient and to relate special conditions to general conditions. If the patient presents himself at a special ophthalmological dispensary, for instance, all the general conditions which may influence a disease of the eye or which may be influenced by eye disease, must be referred to another institution for diagnosis and treatment. The general pay clinic or group diagnostic clinics will solve this problem, in which all departments are well represented in one building for diagnosis. The maintenance of high scientific standards and a spirit of public service, such as generally characterizes private medical practice, are essential in pay clinics.

The group medicine diagnostic idea—self supporting philanthropy—or pay clinics established as a public service enterprise, is a recent development. Patients can be admitted only when referred by a physician, who requests an opinion and report of the case. The charge to the patient should be a flat rate for the examinations, plus extra fees for x ray plates, special tests, such as blood chemistry, complete kidney function, etc., consistent with the circumstances of the patient, but not to be gratis. Free service has a tendency to lower the standard of the clinics and their purposes.

Group medicine practice or group diagnostic clinics should be so organized as to be essentially a cooperative association of a large number of physi-

cians, to prevent skepticism and distrust by the general practitioners of such progressive ideals. This will also greatly broaden the services of the clinics.

The pay clinic may be viewed or appraised from three aspects: 1, the institution; 2, the doctors, and 3, the public.

The Institution.—There is a stimulus to efficient service arising out of the new psychological relation between doctor and patient and between doctor and institution.

The Doctor.—His fees received are gross and not net incomes, considering expenses such as rent, equipment, lighting, heat, records, automobile, etc. In the clinics the physician is supplied with assistants, equipment, plant, and therefore his salary is a net income.

The Public.—It pays less in the end and gets better and more accurate service and results. The diagnosis from correlated opinions, collaborated data and laboratory findings is of the greatest benefit to the public.

Why should not cooperative pay clinics be established by a group of physicians or specialists coming together for cooperative work and having their offices so situated that joint equipment can be arranged? The difficulty would be a defective centralized administration. This, as the experience of all acquainted with dispensary organization and management has shown, is vital to the best cooperative work among physicians, and to the efficient management of the records, laboratory, etc. Where a group of physicians actually established an organization with adequate equipment and complete administrative machinery, the difficulty would be overcome, and we should have pay clinics like the Mayo Clinics for diagnostic purposes, or combined diagnostic and therapeutic. The latter plan may interfere with the practitioner, in that his patients may ultimately wander from his office into the clinics, whereas in the former or group diagnostic clinics, the patients are referred back to the physician who recommended the case, with full data of diagnosis and suggestions as to proper treatment. The physician may report from time to time the progress of his case, for follow up work and tabulating results. The fee should be scheduled so that those of small means, as well as the rich and well to do, might benefit. In general medicine and most of the specialties, especially in diagnosis, there seems to be a considerable field for cooperative medical clinics. The encouragement of pay clinics of either type is a measure of progress in the development of cooperative or group medicine practice on a democratic basis.

The efficient dispensary of the present day needs correction of three faults: 1, A medical organization not sufficiently centralized so that the patient is divided up between clinics without adequate central medical control and interpretation; 2, too much hurry, too many patients for the time allotted for the examining physician, hence too little comfort and too little dignity for the patient; 3, lack of adaptation to the needs of a clientele of wage earners. The group medicine clinics obliterate all these defects.

NEEDS FOR AN EFFICIENT DISPENSARY.

1. A medical staff properly remunerated for its services.
2. A medical organization facilitating cooperative diagnosis and treatment, providing central medical control, interpreted data for reference of the attending physician.
3. Central administrative control of all its branches of dispensary service, carried out by an efficient executive officer, under a board of committees in which the medical interests of the staff and the interests of the laity are both represented.
4. Administrative organization to secure reasonable comfort, privacy, and dignity for the individual patient.
5. Building and equipment of proper standard, good nursing, good clerical staff, and a good social service department.

Although ideals are seldom if ever attained, still the nearest to the ideal seems to be the type of the Mayo Clinics, of Rochester, Minn.; New York Diagnostic Clinics, New York, and the Boston Dispensary, Boston, Mass. We shall give a brief description of the New York Diagnostic Clinics, since it is of the latter we have direct personal knowledge.

These clinics were organized by the New York Diagnostic Society to provide facilities for group diagnosis of cases among all classes. For this purpose the clinic is divided into nineteen separate clinics or departments of modern medicine. These are adequately equipped with all modern diagnostic devices and instruments, including complete modern laboratories for pathological, bacteriological, and animal research work.

The medical staff consists of one chief and two assistants, on a six months' service in each of the nineteen departments, and several full time men who are in the laboratories, general x ray and dental x ray departments, and the anamnestiologist. Physicians receive final appointment only after the expiration of a year's satisfactory service. They must be of the highest type, as to their experience and knowledge in their respective specialties, as well as their character and standing in the medical profession and medical societies. The institution is in fact a composite of the diagnostic facilities to be found in the leading hospitals and dispensaries of the United States and Europe. It is worthy of study for those interested in model clinical and dispensary work as an inspiration for the establishment of similar clinics elsewhere.

CONCLUSIONS.

The advantages of cooperative or group medicine practice for all social classes become more generally perceived. Is the practical situation of the medical profession satisfactory? Would a larger and more general preparation in the work of cooperative clinics improve the financial outlook and status of the rank and file of the medical profession? The answer is decidedly, yes. A higher average income and more stable income and a larger professional opportunity for the average physician, who has had a good training to start with, are desiderata which can

only arise out of more comprehensive organization, which means essentially more work done in medical institutions and more cooperative and collaborative practice.

The world will not fail to remember, however, that the advances in modern medicine which have been made during the world war could only be brought about by cooperation of the medical fraternity in all fields of military medicine and surgery, hygiene, and sanitation. Hence the advantage and necessity of pay clinics with the group medicine idea, which should be the future progressive way for successful practice of medicine.

Twenty-eight years ago Dr. Stephen Smith, a well known clinician who has added much to medicine in our country, remarked at a meeting of the Academy of Medicine: "I predict that in twenty-five years the United States will be the medical Mecca of the world." Therefore, one of two things is necessary, either that a combination of men interested in the various sides of medicine club together primarily to arrive at diagnoses, so that any one of them can cover any scope in therapy demanded in a case, or that we develop a new department, namely, that of the diagnostician, to whom medicine will eventually look in the future.

The sins of omission and commission on the part of different men in the various branches of medicine naturally prompt us to seek for diagnosticians. In the future, this want will become more and more urgent, and it will not be many years before the people will demand such service. Let us in this instance be progressive enough to supply this need when it arrives.

I am greatly indebted to Dr. M. J. Mandelbaum, medical director, New York Diagnostic Clinics, for his valuable suggestions and material aid.

125 WEST SEVENTY-SECOND STREET.

Prostatectomy.—Henry G. Bugbee (*Boston Medical and Surgical Journal*, July 15, 1920) emphasizes the following: 1. The study of prostatic obstruction has had slow evolution, extending back over two thousand years. 2. Not until it became possible to inspect the interior of the bladder were measures for its relief placed upon a definite footing. 3. With the advance in the study of cases, operative measures suggested during the period of obscurity were brought forward and perpetrated with renewed zeal. 4. Anatomical and pathological study of cases has resulted in a certain classification. 5. The objects of relief will best be attained by a thorough analysis of the individual, by procedures instituted to remove step by step and with the least possible shock to the patient the causes of the symptoms. Prostatectomy for fibroadenomatous enlargement can best be accomplished by preliminary suprapubic drainage, the removal of the gland being an incident of the convalescence from the drainage. The most important phase in its removal is the control of hemorrhage, with a careful attention to details during the healing, insuring a rapid functional cure free from complications.

BINOCULAR SINGLE VISION.

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Binocular single vision, or the fusion of two retinal images of an object into a single perception, offers a subject for investigation of more than ordinary interest. Many investigators consider it a visual function rather than a secondary result of ocular activities. Its utility cannot be gainsaid but a little thought will show that it plays a minor rôle to the prime purposes of vision, that of perception of the external world and protection from its vicissitudes. Binocular single vision far from being a purposeful function is a compromise in the play of evolutionary processes. The proof of this lies in the study of the biogenetic development of the visual apparatus and in the study of the factors by which binocular vision is harmonized and antagonism prevented.

It is established that the visual field is divided into two purposeful areas, that of the fovea or central area which is concerned with the nice distinction of details and form, and that of the periphery which is to a high degree sensitive to movement and to the differences of illuminations. In the lower vertebrates the fovea is absent and visual acuity is low so that the search for food and protection must depend largely upon the movement of objects. Birds and higher monkeys are supplied with a fovea and keenness of central vision is added to the quick perception of movement.

Among the invertebrates a binocular field of vision must be extremely rare as the eyes possessed by the different species vary enormously both in number and position, though in most animals that propel themselves the eyes are in the anterior segment of the body. In the cuttlefish and crustaceans the paired eyes occupy a position that possibly may produce an uncertain amount of binocular field. Among the vertebrates a binocular field is generally present except in fish where it is found exceptionally, only among some of the deep sea varieties.

Depending upon the relative positions of the orbital axes for its limitations, and upon the stage of development of the ocular muscles for its range, the binocular field varies markedly in the various subdivisions. Throughout the animal series the biorbital axial angle varies widely. In man and the higher apes the binocular field is large, approximately 120° ; but with increase of the biorbital angle in lower animals the extent diminishes. In the carnivora it approaches more nearly the size found in man, being approximately 100° , while in ruminants it decreases to 50° , and in birds to 30° . The binocular field is not limited necessarily to an anterior position for with an upward or backward displacement of the eyes a binocular field may develop superiorly as in a few amphibia and rodents, or posteriorly as in the albino rabbit. In a few of the lower animals such as the carnivora and herbivora the increase of the biorbital angle appears to be counteracted by the increased size of the corneal surface by which the monocular visual angle is enlarged and the binocular field maintained.

In all classes of vertebrates the extraocular muscles are well developed except in reptiles and birds, in which the movements of the eyeballs are much restricted. Animals in which the head movements are restricted, such as the fish, possess a highly developed extraocular muscular system, and those in which the head movement is free, as in birds, have, as a rule, a more limited extraocular muscular activity. This rule is not without exception, however, as many animals requiring a quickly shifting field of view for the detection of prey and for protection, as the carnivora, are supplied not only with muscles of rotation which at times, in addition to the ordinary movements as found in man, may possess the power of projecting the cornea beyond the lids, but also are supplied with a muscular system not found in man, which allows translation of the globe.

Whereas the extent of the binocular field depends upon the size of the biorbital angle and the range upon the external musculature, the perceptive intensity within the field varies with the acuity of vision, central and peripheral, and with the degree of development of the functions of convergence and accommodation. Central visual acuity varies widely among the vertebrates. In the higher groups only, such as birds, apes and man, does a fovea exist and a powerful accommodative apparatus. The lower vertebrates, having no fovea, must be visually guided by the movements of the external world. Tracing the development of the ocular apparatus we find no valid reason to judge the human eye as the highest or most perfect type. Anatomically and physiologically it occupies in development a place below that of birds. With the evolution of mental characteristics a perfection of other functions is not so requisite as in lower animals not so endowed. The ocular apparatus displays throughout the animal kingdom a demonstrable and excellent adaptation of form and function to environment. The lowest vertebrates, such as fish and reptiles, appear to orient themselves largely by external movement. The herbivora also appear to have a visual acuity available for a short distance and protection and the search for food must depend visually upon a keen perception of movement. The carnivora are better endowed with a perceptive retina and accommodative apparatus though the fovea is absent. The monkeys nearly approach man in the development of the eye, while the birds, in which the retina is highly developed and possesses one or more fovea, have a visual acuity and accommodative apparatus of a degree unapproached by any member of the animal kingdom.

The complete visibility of the external world demands not only orientation and the perception of objects but also the realization of their spatial relations of distance, depth and comparative sizes. For this psychological conception are necessary not only the factors previously described but also that factor derived from the muscle sense produced by accommodation and convergence.

An accommodative apparatus is not exclusively a property of the vertebrates. A functioning lens is found in many invertebrates. In very simple forms such as the snail it is in contact with the retinal cells

and refraction and accommodation are practically negative. Such a primitive apparatus determines only the direction of the light source. For the formation of an image, indistinct as it may be, an eye fashioned upon the principle of the camera is necessary. Such a compound apparatus is found among many invertebrates as crustaceans, insects and worms. Among the worms the first details of a ciliary body appear as a group of small pigment cells between the lens and the retina. In the cuttle fish a distinct ciliary body is discoverable which is attached to the lens and moves with its excursions. In other shell fish such as the pecten the ciliary body consists of a muscular apparatus so arranged as to increase by contraction the convexity of the lens.

While the accommodative act is present in all vertebrates its mode of accomplishment differs in many species. In fish the anteroposterior excursions of the lens vary refractivity. In the bird the act of accommodation is performed secondarily by a similar excursion of the lens and primarily by an increase in curvature of the cornea. Mammals, apart from man, have a weak accommodative apparatus, the mode of activity of which is the same throughout the subkingdom, and needs no elucidation here.

All these factors, the multiplicity of eyes in the invertebrates and their varied positions, the variations in the direction of the orbital axis of the binocular invertebrates and vertebrates, the irregular development of the visual angle and of the external and internal musculature, are directed to the accomplishment of a visual acuity and orientation demanded by environmental exigencies of protection and search, and not to the creation of a binocular single field. The latter describes no regularity of development, and results secondarily when these factors are so coordinated as to bring it into existence. As we shall see a true conception of the visible world and its spatial relations is as possible monocularly as binocularly, the latter furnishing only an increased precision and nicety. Finally, considering the high psychological laws involved in spatial apprehension it is a debatable question whether the binocular field plays any but an adventitious rôle in the animal kingdom below man.

We have traced briefly the anatomical and physiological factors that develop the binocular field. Before studying the factors that maintain single vision within this field a psychological analysis is requisite of the mental concept that produces in consciousness the knowledge of the external world as a material entity of three dimensions. Observers generally look upon binocular single vision as a necessary function in the production of this concept. The apprehension of spatial relations is not, however, dependent upon binocular single vision for it is present though distorted in pathological diplopia, and also in those individuals whose vision is performed monocularly. The concept of space is a compound of qualitative and intensive sensations dependent not only upon visual but also upon tactile and muscular perceptions. Such sensations are, however, of themselves not sufficient to produce a true knowledge of the external world. Upon these must rest a power of consciousness that is constructive, so that the apprehension of space is the product

of experience through the interaction of the association of ideas upon the qualitative sensations. Otherwise the concept is intuitional. The spatial errors of young children and of the blind restored to sight appear, however, to refute this latter hypothesis. Based thus as it is upon highly developed psychological interactions this concept of spatial relations can be present but dimly, if at all, in the low orders of the animal kingdom which may possess a binocular field even more extensive than man's. The processes of evolution appear to have produced adventitiously the overlapping fields by placing the ocular apparatus in the position that gives the widest outlook. In the higher animals, in which the apprehension of spatial relations begins to enter consciousness, secondary factors have been evolved to refine and to maintain the concept undistorted within the binocular field. Were binocular single vision and its refining and maintaining factors a primary rather than a secondary process we would expect to find young children and the blind restored to sight endowed at the incipiency of visual activity with a full and exact apprehension of spatial relations. The earliest apprehension of distance and of surface extension however depends upon the tactile sensations. In the first few months of life the binocular movements are incoordinated and the power of accommodation undeveloped. When the size of objects and their distances apart are apprehended by grasping visual apprehension develops and objects and distances previously acknowledged consciously through the sense of touch become the foundation of visual apprehension. With full development of the latter the conception of space is further clarified by the muscular sense produced by accommodation, convergence and orientation.

Analyzing the concept still further we find that the apprehension of space is extensive while the sensations giving rise to it are successive. Both the tactile and visual images are connected continuously and without interruption though the tactile and visual organs lack this relative continuity, the retina in fact containing the blind spot which is not projected into consciousness. Again we are led to the conclusion that the concept of spatial relations is the product of a power of consciousness that is constructive, and that binocular single vision while a contributing factor cannot be the controlling influence in its creation.

To maintain this concept clear and undistorted within the binocular single field certain psychological and physiological factors must functionate harmoniously. The primary psychological factors are the faculty of fusion by which the two retinal images are merged into one perception, and the faculty of projection by which the retinal impression is projected along the line of direction into the visual field, passing through the nodal point, and thereby furnishing the knowledge of direction and position. These functions are undoubtedly mental. They do not produce the concept but refine it and prevent antagonism within the overlapping fields. Were the spatial concept based upon innate ideas the fusion and projection faculties would be found completely developed at the first visual act. The first evidence of their presence is not manifested how-

ever until several months after birth and they are not fully developed for five or six years.

Within the binocular field the sensations received at the two foveæ are projected to the same place in space if the two eyes functionate normally. If the gaze of the two eyes is directed through two openings of interpupillary distance in a sheet of paper held close to the face the two openings appear as one lying in the median line. Impressions received upon peripheral retinal parts, however, are fused only when they fall upon identical retinal points.

Under the impulse of the spatial perceptions the will controls the actions of the two eyes as though they were a single organ; and the nervous impulses that produce ocular movements are of equal binocular intensity. Each eye is the duplicate, anatomically and physiologically, of the other. Each macula has a common brain cell connection with the other, and every perceptive point in each retina has a corresponding perceptive point in the other retina anatomically connected. Thus two images may be fused into one when the images are produced by these corresponding points. Corresponding points are, therefore, anatomical and physiological facts upon which the psychological factors of fusion and projection develop.

A perceptive point in one retina corresponds with a perceptive point in the other when images upon them of the same external object are projected as one. When, however, the images are not blended diplopia results, for the perceptive points are not identical.

Every visual act embraces a field of view that is complex. Objects occupy every possible plane in relation to the visual line. The eyes rapidly pass from point to point, orienting themselves, converging and accommodating. In each visual act, therefore, a large number of objects do not fall upon identical points. For every direction of the gaze certain objects which lie in space so as to fall upon identical points appear single, while all other objects falling upon nonidentical points produce a physiological diplopia. This, however, does not cause confusion, but rather adds to the delicacy of the spatial concept. The blurred peripheral images act as directors of the visual line so that the eyes easily pass from point to point estimating distance and direction. A complete concept of the field of view combining perspective and stereopsis is thus obtained, and the double images being closely associated and falling upon retinal parts of low perceptivity do not produce diplopia in consciousness until the attention is drawn to it voluntarily.

While the sense of direction depends upon the faculty of projection the realization of form size and distance rests largely upon the muscular sense. Muscular perception arises not only from the interplay of the conjugate muscles but also from the action of convergence and accommodation. The muscle sense is complicated, being compounded of the sensations derived from muscular activity and from their mental interpretation. The tension or effort of the muscular action and the result or the muscular contraction accompany the voluntary mental control and produce in consciousness a knowledge

of the intensity of impulse demanded for a particular action. The knowledge of direction, therefore, and indirectly of the size and distance of objects, depends upon the consciousness of the degree of energy required to bring the visual line into that direction. Once again we perceive that the spatial concept is not innate but founded upon knowledge derived from experience.

The previous discussion has dwelt largely with the apprehension of the first and second dimensions of space. We have seen that the spatial concept does not rest entirely upon ocular sensations, and that binocular single vision is not so essential that its absence would prevent the production of the concept. The apprehension of depth and relief, the realization of the third dimension of space, likewise is not exclusively a binocular function. Monocularly the apprehension of the third dimension may be derived in many ways. Stereopsis or the sense of relief may be produced monocularly by the effects of shadows and shades and by mathematical and aerial perspective. From accommodation and from parallax movements of objects when the eye or head is moved the knowledge of distance and anterior posterior extension is derived. Solidity is thus realized.

Binocularly stereopsis and perspective vision are more exquisite and refined. As an object may now be perceived from two different aspects the sense of solidity is heightened. This constitutes stereoscopic vision. Perspective vision is the perception of objects at varying distances, the knowledge derived from the muscular actions of convergence and accommodation furnishing a sense of depth.

It is not essential in this brief review to enumerate the various factors existent in the external world, such as shadow play and relative sizes and distances of objects, that enhance the sense of depth and relief; nor is it essential to analyze more fully the subjective elements of stereopsis and perspective. The purpose of this paper is to analyze the spatial concept and show that it is not entirely an ocular production; and that while the function of vision is a primary factor the concept may rest upon monocular as well as binocular perceptions. Biogenetically the binocular field and its manifestations have been evolved not to produce the concept but, having been evolved secondarily, have been developed to conform to and not to antagonize the concept.

The sense of solidity and depth are neither essentially ocular, tactile nor muscular but a complex of these sensations acted upon by the association of ideas, in which memory and experience play an important rôle. The completed concept is the result of a constructive mental function.

Treatment of Tuberculosis Epididymitis.—H. Wildholz (*Schweizerische medizinische Wochenschrift*, June 17, 1920) discusses the advantages and disadvantages of excision of the epididymis in this condition, and seems on the whole to favor this operation. Yet the psychological injury produced on a young man by a double castration is so great that it cannot be recommended. In a great many cases also the disease is too far advanced for an excision of the epididymes to be effective in checking it.

PRESENT STATUS OF RABIES.*

Clinical and Microorganismal.

By B. M. UNDERHILL, V. M. D.,
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As to the present status of rabies, I can bring little before you but what is of common knowledge to medicine, for I am not aware of anything new having been reported from research in this line during the past two or three years. Probably all warm blooded animals are, in varying degree, susceptible to this disease which has been termed rabies, lyssa, canine madness, or hydrophobia, all of which terms, except the last, may properly apply to it in lower animals, the dread or fear of water never having been observed in these, though, whether or not a true specific symptom, it does appear in man.

So far as I know, Noguchi, of the Rockefeller Institute laboratories, has made the most recent report upon investigations with Negri bodies. This deals with the cultivation of the parasite, as he terms it, of rabies. Noguchi undertook to cultivate the virus of rabies from the brain and medulla of rabbits, guineapigs, and dogs infected with street virus, passage virus, and fixed virus. His results were obtained by methods employed for the cultivation of spirochetes of relapsing fever (1). His cultures were minute granular bodies which, on transplantation, reappeared in new cultures through many generations. He observed that in the cultures from passage and fixed virus, round or oval nucleated bodies surrounded by membranes appeared. He demonstrated the cultivated nucleated bodies actively multiplying by division and budding, and exhibiting the appearance of protozoa. In size they were one micron to twelve micra. By inoculating cultures containing the granular or nucleated bodies he has produced rabies in dogs, rabbits and guineapigs with typical symptoms and positive animal inoculations.

It might be said here as to the terms street and fixed virus that street virus is from rabid dogs naturally infected. When street virus is inoculated into a rabbit it reproduces the disease in fourteen to twenty-one days or more. This street virus is then conveyed from rabbit to rabbit through a number of transfers. It thus becomes more virulent for rabbits and the period of incubation of the passage virus is progressively shortened. Finally the rabbits invariably sicken on the sixth or seventh day and die on the ninth or tenth. When the virus has reached this degree of virulence for rabbits it is said to be fixed, that is its potency remains constant. Fixed virus, which has obtained a high degree of virulency for rabbits, has lost much of its virulence for dogs, and is probably avirulent for man.

For the Pasteur treatment the fixed rabbit virus is used. The rabbits are injected with the fixed virus under the dura mater. A rabbit thus inoculated should begin to show symptoms in six to seven days and die on the ninth or tenth day. The spinal cord is then removed and hung in a jar containing potassium hydroxide. Jars containing the cords are kept in a dark place at a temperature of 20° to

22° C. Under these conditions the cords gradually desiccate and the virus diminishes in virulence until the fourteenth day, when it is no longer infective. Pasteur started treatment with a cord fourteen days old. A small portion of the cord is ground in sterile salt solution and injected into the subcutaneous tissue of the abdomen.

The original method of attenuation of virus and treatment of Pasteur has been modified in many ways. Many Pasteur Institutes now start treatment with an eight day instead of a fourteen day cord. "Ferran in Barcelona, Proescher in Pittsburgh, and others inject patients with the unaltered, fresh, fixed virus. The advantages in using the virus as fresh and as strong as possible are that an active immunity is produced more quickly, and this is of considerable importance in wounds of the face, also in wolf and cat bites, which frequently have a short period of incubation. Further, only one or two injections of the fresh virus are necessary to produce an immunity, and this shortens and simplifies the treatment very much." (2)

Proescher (3) injected into himself the entire brain and medulla of a rabbit (fixed virus), and another entire brain into a volunteer with no ill effects in either case. A control rabbit injected with a 0.02 dilution of the same emulsion died in seven days with experimental rabies.

In the laboratory of the Pennsylvania State Bureau of Animal Industry our method of examining material sent in for diagnosis where rabies is suspected is as follows: The brain and ganglion nodosum, (the second ganglion of the pneumogastric) are removed. Impressions are made upon slides from the transected hippocampus major and from the cerebellum, and portions of each, with the ganglion nodosum, are placed in eighty per cent. alcohol for sectioning. Portions of the hippocampus and cerebellum are also placed in glycerine for animal inoculation should it be desired that this be carried out. The impressions are fixed in methyl alcohol for a few minutes, dried, and stained with:

Sat. alcoholic sol. carbol fuchsin.....	1 c. c.
Loeffler's methylene blue.....	30 c. c.
Water, q. s.....	100 c. c.

Heat upon slide, simmer and allow warm stain to remain for about thirty seconds.

Examined with oil immersion lens, the nerve cells, if properly stained, will be blue, the Negri bodies a maroon red with one or more dark stained inner bodies. Careful impressions show the bodies within the cytoplasm of the nerve cells. If the brain material is more or less smeared upon the slide many of the bodies will appear as extracellular in the spread cytoplasm. Sections are stained with hematoxylineosin or with the Mann stain.

During twelve months in 1915-16 thirty-three brains of dogs dead from causes known to be other than rabies were examined in our laboratory. All were treated in the routine outlined for examination for Negri bodies. A thorough search of this material failed to reveal any intracellular or extracellular structure that could be regarded as a Negri body, and in no case were there changes in the ganglion.

As to the reliability of changes in the ganglion in the diagnosis of rabies, some investigations were carried out in our laboratory for a period covering

*Read before the Pathological Society of Philadelphia, March 25, 1920.

two years in 1914-16. Four hundred and fifty-three brains of dogs were examined, sections of the ganglion nodosum being made in each case. In 223 of these both brain and ganglion were positive, in 187 both brain and ganglion were negative, in nine the brain was positive, ganglion negative; in thirty-four the brain was negative, ganglion positive. In the last case it is probable that the Negri bodies escaped observation in the brain examination, or that the material, through decomposition, mutilation or other cause, was in unsatisfactory condition for preparation and staining. From these findings we concluded that in all cases submitted for diagnosis the ganglion nodosum should be preserved and, in the event of negative brain findings, examined. If the sectioned ganglion showed diffuse or distinct localized proliferative changes it warranted a diagnosis of rabies.

To the practiced laboratory worker frequent observation of Negri bodies stamps them with such morphological and staining characteristics as to make it unlikely that he will confuse them with other corpuscular elements. Accepting it as true that these bodies are only present in the central nervous tissue of animals which were suffering from rabies at the time of their death, the case is at once returned as positive to rabies where the bodies are found.

It is not within our province to advise as to the treatment of persons bitten by animals suspected of rabies; that is a matter at the disposal of the physician in charge. In the event of advice being asked for, we would suggest the following:

1. While the presence of Negri bodies is proof positive of rabies, failure to find them does not warrant a negative diagnosis. If an animal has exhibited symptoms of rabies treatment should be given, though no Negri bodies and no ganglion changes have been found in the material submitted. This is especially true if the animal has shown changes in disposition, expression and voice, a tendency to roam, an unusual disposition to bite, or partial dropping of the lower jaw.

2. If a person has been bitten by an animal, and the animal is securely confined so it can do no further harm, it should not be killed unless distinctly rabid. If killed before or during the initial symptoms it is probable that changes in the central nervous system will not have had time to develop; laboratory examination cannot aid, therefore, in removing the uncertainty. If the confined animal lives and remains normal, Pasteur treatment of the bitten person will be unnecessary. If rabies develops in the animal within a week or ten days following the bite, treatment of the bitten person is advisable as the saliva may already have become infective. The confinement and observation should extend over a period of at least two weeks. Dogs usually die in a few days from the inauguration of symptoms.

3. While the period of incubation is in any case of natural infection far from exact, clinical experience has shown that this period is shortened relative to the proximity of the seat of inoculation to the brain. Face bites, therefore, call for more prompt and intensive treatment than those upon the hand

or leg in order that immunity may be established before expiration of the incubation period.

In any review of rabies a case is made out against the dog as the principal offender. Through his susceptibility and tendency to roam and to bite, he is the reservoir and disseminator of the disease. In general, the dog has certain qualities which tend to make him attractive to man, while, on the other hand, he has characteristics of habit which, to sane minds, brand him as a disgusting nuisance. Restricted and properly cared for by a responsible owner, he may well be tolerated; unclean and without restraint, he is a menace to public health. He harbors more intestinal parasites than any of our other domestic animals, and certain of these can readily be conveyed to man. Through the dog's intimate association, especially with children, he runs a close second with the house fly as a direct transmitter of pathogenic bacterial and parasitic organisms. It is well known that the dog furnishes essential hostage to stages in the life history of certain parasites of man, as well as parasites to other animals used as human food.

Echinococcosis occurs in man, cattle, sheep, horses, hogs, and numerous other animals. The hydatid is derived from ingested material contaminated with eggs from a three segmented tapeworm (*Echinococcus granulosus*) about three sixteenths of an inch long, which may inhabit the small intestine of a dog by the hundreds. The dog is practically the only carrier of this tapeworm. In domestic animals the cysts are commonly found in the liver, usually multiple, and may reach the size of an orange, or maybe larger. In these animals the hydatids are seldom, if ever, fatal. The longevity of lower animals, especially those used for human food, is relatively short, and the cyst, a slow grower, probably does not reach its full development. In man, where the development has not been checked, the hydatids are said to reach the size of a child's head. A common tapeworm of the dog, *Dipylidium caninum*, may also infest man, principally children. Hall speaks of a case in which as many as two hundred and thirty-eight of these worms were found in a single person. The intermediate host of the worm is the dog flea or louse, probably in most cases the flea. Infestation with the tapeworm is by ingestion of the flea containing the larva (*Cryptocystis trichodectes*). Children in their intimate association with dogs, especially if they have food, as sticky candy, about, may easily have a flea or two conveyed to the stomach. The larval worm is there set free and, passing to the intestine, attaches to the mucosa by its armed rostrum and sucker disks and proceeds to develop the strobila which may reach a length of about fourteen inches.

A round worm of the dog, *Toxascaris limbata*, may find hostage in man's intestine. The infestation is direct by ingesta contaminated with the worm's eggs. Dogs are also accused of playing a part in the spread of diseases due to fungi, such as ring worm and favus.

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PROTEIN FEVER.

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At various times and places the otologist sees patients with suspected sinus thrombosis, or mastoiditis; whichever it may be, it needs draining; then the patient recovers, or succumbs, or hangs in the balance indefinitely. These balance cases are encountered in other diseases besides those found in otology. We will, however, consider only those which would interest us most, namely; diseases of the ear.

My observations on these balance cases extending over a period of fifteen years were mostly on post-operative cases, but they occur just as often before. I have found that patients often have a vacillating temperature of such extreme variations that it makes the physician worry, not as to cause, but as to result. When a patient is seen but once a day the thermometer may read from 104° to 106° F. every day for a week or more. If a record were taken every three or four hours he would find that the temperature recedes after a short high spurt, and repeats that performance, usually every day or so. A physician with considerable experience will at once think of sinus thrombosis. So typical a temperature will only be found where the channels are peculiarly situated as those within the skull cavity. There are sharp as well as obtuse angles in the various brain sinuses, such as obstructions found at the jugular bulb and veins entering the sinus at right angles. All these further the formation of clots. Particles are then swept into the blood stream causing certain disturbances which will be described later.

A thrombus is always a pathological condition but may not be septic. Bacterial invasion may be checked spontaneously before operation or afterwards. Bacteria may not be pathogenic unless they are able to propagate by feeding on the surrounding medium. While growth continues proteolytic enzyme is being formed, or the cell is being sensitized (which we will designate as the period of incubation) and as the poison in the circulation comes within the sphere of the cell it is digested with the evolution of heat. When, however, the bacterial cell protein is overwhelming, instead of a rising temperature we may have a falling temperature and a consequent depression. The severity of the symptoms depends entirely upon the degree of infection.

On the other hand, if the foreign protein is not infectious and is introduced at frequent intervals then there are often no marked symptoms except a high and low temperature, rising during digestion and gradually dropping again to normal at its conclusion. A marked chill may also occur though usually there is only a rise of temperature. Chilly sensations up and down the back are quite common. Unless protein from a thrombophlebitis is infectious it is digested with the elimination of heat, but there are no symptoms of depression. When the foreign body is large enough it may obstruct certain vessels, be-

coming an embolus. This condition is out of the category of this discussion.

When we come in contact with different zymotic diseases such as typhoid, scarlet fever, or spotted fever, we at once paint a mental picture, not only of the causative factor, but also of the destruction in progress. We know the effect produced in typhoid fever in the spleen; the skin in scarlet fever, and the meninges in spotted fever, and because of these ocular manifestations we are accustomed to follow the ancient observers and apply a name to an effect. If we would investigate closely we would find that all poisons of infection are the same. Different bacterial proteins manifest their predilection for certain cells only, and then we may have hay asthma affecting the air passages; typhoid, the spleen; rheumatism, the joints, etc. A protein, not being a toxin in itself, does not develop or propagate in the surrounding medium and therefore is easily disposed of by digestion and fever, without much more general disturbance. For that reason one can usually give a favorable prognosis and not subject the patient to unnecessary worry which produces no good, but perhaps a tedious convalescence.

For a number of years I have contended that

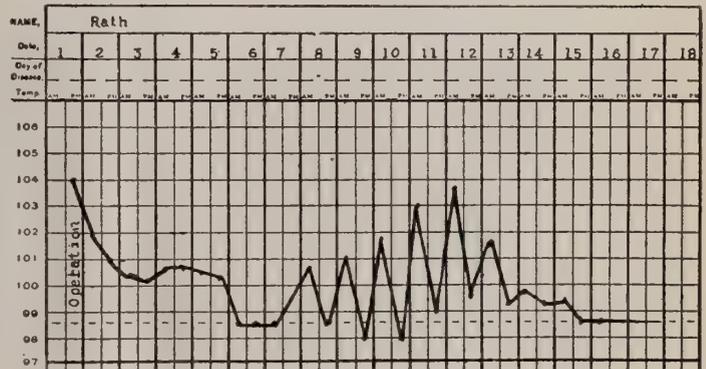


CHART I.—Radical mastoid operation. Sinus thrombosis, which had broken down and formed pus in centre; epidural abscess. After operation temperature fell to normal; after the seventh day temperature rose and continued to rise and fall for a week, then gradually recovered. At the height of the fever, which reached 104.5°, the consulting surgeon said the patient would die; I disagreed. The patient recovered.

typical temperature of protein digestion is not septic or due to infection. My remarks were greeted with a smile of incredulity in certain quarters. Therefore, I thought it best to make a somewhat more elaborate statement and emphasize the difference between infectious and noninfectious substances.

Many of us have encountered cases with temperatures simulating sinus thrombosis and have operated upon the patients and found practically nothing. If we would take into account that it requires more than temperature to prove the existence of a septic clot in one of the brain sinuses, we should hesitate before coming to conclusions. I do not wish to convey the impression that one runs much risk in opening the sigmoid sinus, but it may cause much delay in a patient's recovery.

My attention was first attracted to such a condition in a physician. My impulse was to open the sinus and this course also met the approval of a surgeon and an internist, both men of large experience. I hesitated because the patient's temperature

after five or six days remained normal for twenty-four hours and then took another sprint upwards. I counseled watchful waiting. Then scrutinizing accompanying symptoms I decided that I could safely take a chance, and the patient recovered.

constant, but remitting from time to time. This fever is caused by the sweeping into the circulation of infinitesimal particles of the new clot, causing a rise in temperature. Each succeeding particle produces the same effect. If bacterial invasion continues and thrives within the clot they will be swept into the circulation producing not only spurts of high temperature but also delirium, nausea, chills, sweats and in general marked to profound depression, as in bacteremia. On the other hand, when bacterial propagation has been checked or become arrested, from some cause or other, it happens at times that the particles keep on being swept into the circulation as before until the clot is finally set. This is not an occasional occurrence but I believe quite common. Fever is produced which causes alarm. It is just this latter class of cases that seems to bother the otologist and the surgeon from time to time. They occur before an operation or after one, but always cause concern. Before considering the cause and

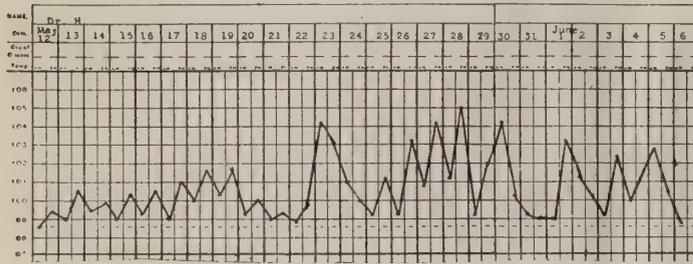


CHART II.—Radical mastoid operation. Caries. Fifth day after operation, temperature rose and continued to rise and fall for a week. At the end of that time, in consultation with two eminent men, an internist and a surgeon, it was decided to explore the lateral sinus. But the next day the temperature returned to normal and I put off operation. Final recovery.

Since then I have had a number of such experiences and in every instance I gave a favorable prognosis without further operation, and all of the patients eventually recovered. Some years ago I presented a paper on this subject before a local society, in the discussion of which Dr. Bentz, a Buffalo pathologist, said I might find a solution of the problem in the experiments of Vaughan which he conducted during a period of fifteen years and which can be found in his book (1). The conclusions given here are entirely drawn from Vaughan's work. Although it is only theory it is so palpable and his experiments so exhaustive that I can but accept the conclusion drawn therefrom.

Let us draw a mental picture of a case with suppuration of the middle ear and phlebitis of a sigmoid sinus, or symptoms which would lead us to think the sinus was involved. First we have irritation of the wall, its endothelium becomes desquamated, its walls softened, thickened and sometimes disintegrated, coagulation of blood occurs in the vessel. Up to this time we may have had no symptoms referable to sinus thrombosis.

Now, however, the patient begins to show signs of fever, that is, bursts of fever, not continuous or

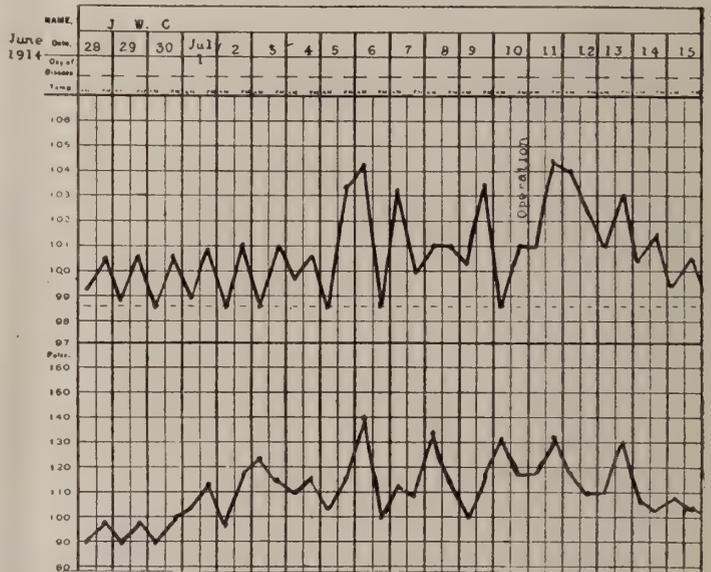


CHART IV.—Mastoid disease. Patient thought to have typhoid fever; after two weeks drum head ruptured and discharged pus for about ten days, when I saw him. His trouble was supposed to be acute mastoiditis. Found sclerosis due to recurrent attacks; mother denied previous ear disease, but acknowledged boy had complained of earache off and on. Red cells, 4,250,000; white cells, 10,000. Lingered for several weeks after he left hospital, then recovered.

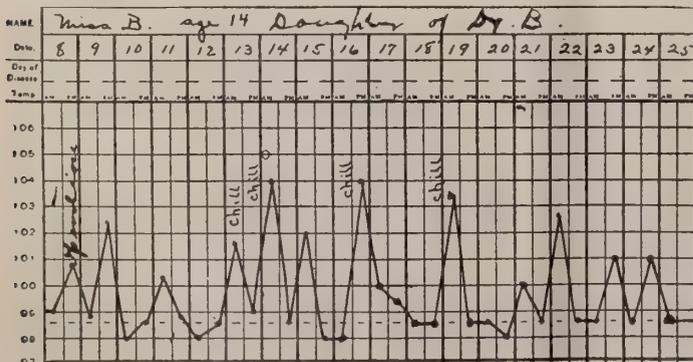


CHART III.—Mastoid disease. The peculiar temperature caused an examination by the physician and a surgeon, and they concluded the patient had endocarditis. The only murmur heard was over the left scapula toward the vertebræ. Recovery.

giving a valid and plausible explanation for it, I want to emphasize the fact that these cases are not septic and do not end disastrously. But to differentiate one must notice that although the temperature is of the recessional type the patient does not become worse from his fever, is not nauseated, delirious nor depressed. His leucocyte count is seldom over 10,000; he feels comfortable, smiles, eats with considerable relish, and sleeps three or four hours at a stretch. In fact he complains of little. Some have chills, to be sure, and perspire afterwards while others perspire only after their spurt of temperature but they all eventually recover. The temperature differs from the virulently septic type in this way, that every few days it remains normal,

this way, that every few days it remains normal,

to resume its flight again after this period of rest. When a septic temperature comes down to stay it means either recovery or death. This is not so in protein fever. Now let us look into the cause of this peculiar phenomenon.

A protein molecule introduced into the circulation whether enteral or parenteral is a foreign body and must be removed. It is the business of a similar protein cell to perform that duty. When the foreign protein attacks or is attacked, a ferment is formed by the body cell and the invader is digested. The foreign protein is not a toxin, it is a cause of the formation of the antibody and consequently the cell is now in a state of anaphylaxis. In other words, the cell having been warned gets its ferment ready for the next invasion of a similar protein. If in the intervals there should be introduced other foreign material dissimilar in character the same prepared cell will not act, but other cells will become sensitized.

A toxin is always a protean. All these proteans contain a poisonous group that ordinarily proves

once been attacked, is forewarned and gathers reserve force in the shape of more ferment, and is ready for any future attacks. If these attacks come early and often each is disposed of gradually. On the other hand if there is an interval of several weeks there may be so much ferment stored up that the protein is overwhelmingly attacked and thus sets free the poisonous group of the molecule of foreign protein, often causing such disastrous results. Now to analyze further: All proteins contain a poison group but remain harmless until separated from their secondary groups and thus the intensity depends upon the thoroughness and probable rapidity of isolation. Foreign protein, as for instance taken from a forming thrombus, may not be infected with bacteria yet in its ultimate destruction cause a rise in temperature. This phenomenon is what I mean by protein fever.

How may we differentiate between protean digestion and sepsis? The patient's life may depend upon your action. Your attention is first attracted to the rising and falling temperature taken every

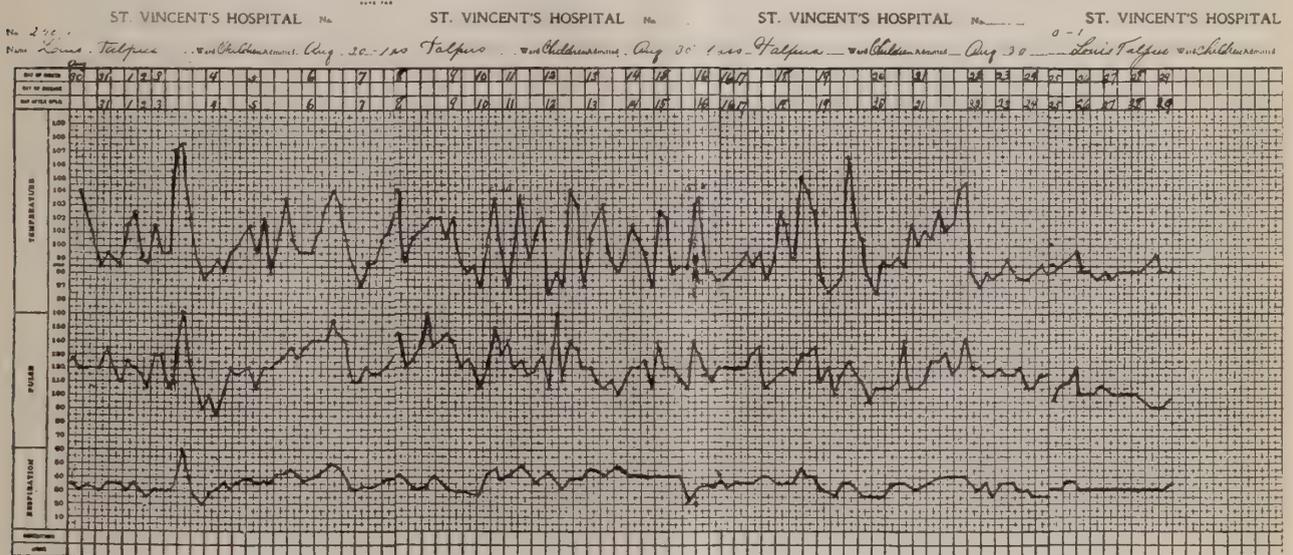


CHART V.—On September 3d, four days after the operation, the patient had a chill, and immediately afterward the temperature per axilla was 107.6°, pulse could not be positively counted, respiration 60. Had a consultation and decided to take blood cultures in an effort to determine whether the lateral sinus was involved. Agar, gelatin, and broth: cultures were negative. Took another blood culture September 10th, and it also proved negative. On September 19th the temperature rose to 106.6°; pulse 125, and respiration 35. Had another consultation and decided that, further blood cultures proving negative, we would not interfere with the patient, who, in his extremely precarious condition and pneumonic state, would not well stand the anesthetic nor operative investigation of the lateral sinus. Three days after this the temperature dropped from 104.4° to 98.6°, and has remained normal ever since, and the patient's convalescence was uninterrupted.

harmless. They may act as a virulent poison under certain conditions. Let us lead up to such a condition. A minute particle of the thrombus, which may be microscopical, is swept into the circulation. How small a particle is necessary cannot be stated. Many chemical poisons cannot be found with the microscope yet their symptoms are plainly manifest. It immediately becomes a foreign body and the circulating fluid must get rid of it, so it is brought within the sphere of the cell, which being stimulated to activity evolves a ferment and gradually digests the intruder. This process is always accompanied by heat and consequently there is a rise in temperature. As the process is completed the temperature falls again. This occurs after each successive invasion of the circulating fluid by a foreign protein. The cell now having become sensitized, or having

four hours. In protean fever besides the peculiar temperature there may be chills, sometimes severe, followed by perspiration, seldom headache. There is no pain in the mastoid region. The patient sleeps fairly well, feels well, has a good appetite, leucocytosis may be high. Some cases reported showed thirty thousand or forty thousand but usually ten thousand or twelve thousand only. The percentage of the mononuclear cells increases or the number remain stationary for a time and does not decrease. Sepsis also shows high and low temperature with severe rigors and sweating and anorexia. The patient sleeps badly, and there is an increasing depression. These symptoms gradually grow worse to dissolution. The blood count is helpful in both cases; in sepsis look for bacteremia, rising leucocytosis with increased polynuclear per-

centage and a falling percentage of mononuclear cells. When hemolytic streptococci are found, the case must always be treated energetically. A deceptive class of cases is that following some kind of epidemic, like the so-called influenza. For instance, patients may go on with mild symptoms for several weeks and possibly end disastrously but in these cases pain over the mastoid is always present and always deep seated. The temperature seldom runs very high, but these cases are treacherous. However, the blood picture will usually tell the story.

There are many case reports appearing in literature in which a tentative diagnosis is made of sinus thrombosis with recovery because they do not show a septic chart. A thrombus does not necessarily mean danger whether it is in the cranial sinuses or other veins in the body. This may be noticed in many cases of thrombophlebitis in the lower limbs; if all sinuses were opened postmortem we might be surprised to find thrombi that were never suspected. We remove a thrombus because it is septic, never because it is present. A septic thrombosis is often rapidly fatal, even when removed early. Sepsis is often profound and it may take the patient weeks to recover. A slow forming thrombus gives a far more favorable prognosis, especially if the temperature does not reach 105° or 106° F. repeatedly. I have never found these to be fatal when a remission lasted over twenty four hours. My experience has been with suppurating otitis only, and therefore cannot be equally positive in zymotic diseases. (In endocarditis a similar temperature may occur.)

A case reported by Dr. Alter, of Toledo, seems to be fairly typical of protein digestion. Alter states, in summing up, "we abstained from further interference, being well aware of the fact that had this been a case of sinus thrombosis we would very likely have lost our patient."

The doctor unfortunately assumes that all cases of sinus thrombosis are fatal while the fact remains that only in septic cases do the patients fail to recover.

I believe it is quite common to regard sinus thrombosis in otology as extremely dangerous. My object in this paper is not to regard it lightly but to call attention to the many patients who recover without further operative interference and give a possible explanation of the prominent symptoms.

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1001 MAIN STREET.

Clinical Signs of Cancer of the Esophagus.—Guisez (*Presse médicale*, May 5, 1920), on the basis of cases subjected to esophagoscopy and subsequently kept under observation, lays stress on certain clinical signs, viz., frequently very insidious onset, selective dysphagia as regards bread and meats, preservation of the appetite to an advanced stage, expectoration of small amounts of blood-stained mucus, malodorous breath, and a white coating at the base of the tongue. Differentiation from inflammatory strictures and pseudocancers is sometimes difficult; in this event esophagoscopy settles the diagnosis.

LONDON LETTER.

(From our own correspondent.)

Aid for Tuberculous Women.—British Hospital Closes.—Cause and Treatment of Visceroplithis.—More Medical Students in Great Britain.

LONDON, June 6, 1920.

The committee of medical men appointed by the Minister of Health to advise his department in reference to tuberculous diseases have during the past two months been engaged in the selection of sites for the ten village settlements which are to be established in Great Britain for ex-service men. The committee are able to report great progress, as they have settled upon six sites out of the eight to be allotted in England. These are in Norfolk, Cambridgeshire, Essex, Kent, Yorkshire, and Cheshire. One settlement is to be provided in Wales and another in Scotland; and it is probable that an eleventh will be established in Ireland.

It was pointed out recently in the *Daily Telegraph* that while the various training colonies and industrial centres for tuberculous ex-soldiers and ex-sailors are still developing, and likely to be of great help to the men, no provision has been made for women suffering from tuberculosis, of whom there are many in England who are obliged to work for a living, and yet, on account of their health, are unable to work in towns. It is suggested that the State provide institutions or sanatoriums in which these women can work at various industries and earn enough to support themselves. Attention is drawn to the fact that so frequently one sees young women just commencing a career smitten with tuberculosis. They have sanatorium treatment for about three months and are then told that they must on no account go back to their former employment if they wish to keep well. They are faced with the difficulty of learning a new occupation and finding ideal conditions of labor, generally a sheer impossibility. Some are fortunate enough to have people on whom they can depend, others go from one sanatorium to another costing the State at least two guineas a week; others again leave the sanatorium to take up some work, but have to return in the course of a few months for further treatment. If an institution could be provided where the stronger subjects could live under ideal conditions, and thus continue their treatment, they could work at one or another of the occupations provided, and at least help to earn their board and lodging. If, in addition to providing the institution and bearing the initial cost, the State were prepared to offer a small wage to each worker, possibly repayable from the sale of her work, it would enable the women to provide themselves with clothing and, to some extent, free their mind from worry. It is urged that all the women should be insured under the National Health Insurance Act, so that if they break down and draw sick benefit they will be treated in the same way as the men.

* * *

An illustration of the financial stress of British hospitals was afforded recently by the announcement of the decision to close the inpatient department of the National Hospital for the Paralyzed and Epileptic, Queen's Square, Bloomsbury, Lon-

don. It was stated some little time ago that the hospital was sadly lacking in funds, but it was hoped that in view of the reputation of the institution and the splendid work it was doing and had done, an appeal to the generosity of the public might have the result of raising sufficient money to tide over the existing difficulties. However, the aid has not been forthcoming, and there is no alternative but to curtail expenses in every possible way. The greatly increased cost of living has weighed heavily on all charitable institutions. The expenditure of the hospital in question has risen during the past five years from £16,000 to £32,000 on which an annual deficit of £7,000 has been incurred, and, as said before, the committee have come to the conclusion that the only course left is to close the wards. The outpatient department will remain open, but no more patients will be admitted for treatment, and a long waiting list has been cancelled. Dr. Addison, the minister of health, stated in the House of Commons a few days ago that he had been given to understand that the King Edward Hospital Fund was prepared to consider the application from the hospital for an immediate emergency grant.

* * *

At a meeting of the Edinburgh Medico-Chirurgical Society, held on June 2d, enteroptosis and associated conditions were discussed. Among those who took part in the discussion was Sir Harold Stiles, who said that of all the subjects in the borderland of medicine and surgery that of visceroptosis probably interested him most. In the majority of cases the patient had been treated by the physician, the gynecologist, and ear and throat specialist before coming to the surgeon. The surgeon, therefore, saw the late cases, but the important point was the origin of the condition. There must be an anatomical and developmental cause for the condition. The perfectly normal person, in the sense of the anatomist or sculptor, was the exception rather than the rule; but within certain limits of variation many persons might be regarded as normal, and there might be considerable departures from this and yet no symptoms might arise. There were often physical defects which, in the first instance, did not lead to disease. There were variations in the skeleton, and the long and slender type supplied the cases of visceroptosis. In certain families it was not difficult to understand from the configuration why there might be displacements of the stomach, kidney, ovary, colon, or uterus. Diversity must be expected in the number and position of folds, because of the complexity of development of the intestine and peritoneum. Certain children were born with a degree of visceroptosis, and it was only a question of time before symptoms would arise. The proximal part of the colon, because of the way in which it was slung and because of its greater absorptive function, gave rise to symptoms much more readily than the distal part. The formation of various bands was described. The absorption of toxins led to faulty muscular tone, involving both voluntary and involuntary muscle. Innervation was interfered with, adipose tissue was lost,

and the viscera tended to slip downward. An essential in treatment was physical education, and if this was carried out in children of predisposing type, the visceral and associated clinical conditions would not occur. Enteroptosis affected more women than men. It was more common among the unmarried and the married without children, and it was possible that there was a subtle something, perhaps of a sexual character, which determined the onset of symptoms. In bad cases a plaster cast should be taken and supports made from it. Exercises were essential. In the neurasthenic patients, presenting severe symptoms, removal of the proximal part of the colon was of benefit in carefully selected cases. Sir Harold Stiles said that he had done the operation in sixty cases. He had been able to follow twenty-seven, and in a third of these there had been great improvement, in one third some improvement, and only in two cases had there been no benefit. Mr. Dowden agreed with him that symptoms often did not arise until what he also has noted as a "subtle something" had occurred. This was sometimes a mental shock or worry. Dr. Edwin Bramwell said that emotional conditions often determined the onset of symptoms, and referred to the danger of setting up an anxiety neurosis by the search for an insistence on a physical cause for symptoms. Perhaps, after all, visceroptosis is more of a neurosis than due to physical causes, or is it the physical cause with its attendant or subsequent toxemia that brings about the neurosis? Sir Arbuthnot Lane insists that the neurosis is the effect and not the cause of visceroptosis, and his opinion carries great weight.

* * *

At a recent meeting of the General Medical Council, Sir Donald MacAlister, the president, said that while on the home list only 872 practitioners were registered in 1919, no fewer than 450 were registered in the Colonial and foreign list. The result was that the total number of new names was higher than in any year since 1915. The proportion of woman practitioners had increased and was likely to increase during the next year or two. It was said, however, on good authority, that their services were in less demand than during the war, and that newly qualified women were finding difficulty in obtaining suitable opportunities for professional work. Supply and demand would no doubt adjust themselves in time but in view of the large entry of woman students it was proper to warn those concerned that in the meantime individual disappointments might be encountered. The Medical Students' Register indicated that the depletion of their professional ranks by the wastage of war would in a few years be much more than made good by the addition of newly qualified men. No fewer than 3,420 medical students, men and women, were registered in 1919, as compared with 1,600 in 1914. The number of registrations exceeded by over 1,000 the highest previously recorded, namely 2,405 in 1891. The strain thrown upon the medical schools of the country was for the time excessive, and most of the schools would welcome an ebb in the tide of applican^{ts}.

Editorial Notes and Comments

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PHYSICIAN AUTHORS—DR. OLIVER
WENDELL HOLMES.

America's greatest physician author, Dr. Oliver Wendell Holmes, was a gentleman and scholar of the old school whose poems and essays stand high among the classics of the literature of this country. He was a novelist, too, but his fame as a novelist proved to be somewhat ephemeral. Nevertheless, his *Elsie Venner* was the most lauded novel written in America during the decade of 1860-70. "Medicated fiction" Dr. Holmes called it, chatty, discursive and brilliant, but hardly a novel in the strict sense of the word. Elsie is a mere case of antenatal impression. The plot is what the critics are wont to call extravagant and unconvincing. Sad to say, a vast majority of fiction plots are of that very calibre. But Dr. Holmes's object in the writing of *Elsie Venner*, as he pointed out, "was to bring the dogma of inherited guilt and its consequences to a clearer point of view," and there is no gainsaying that this object was adequately achieved.

In *Elsie Venner* many subjects that are not germane to the story are discussed with the same brilliant wit and kindly humanity that characterize *The Autocrat of the Breakfast Table*, and its companions of the breakfast table series, *The Professor* and *The Poet*. It is on these three volumes, and especially on *The Autocrat* and *The Professor*, that the fame of Dr. Holmes chiefly rests. *The Autocrat* was the first. The first installment of it was published in the first issue of the *Atlantic Monthly* and leaped

into general popularity overnight. *The Autocrat* appeared in the first twelve numbers of the *Atlantic* and served to keep that new literary venture on its feet during the panic of 1857. The name *Atlantic*, incidentally, was Dr. Holmes's suggestion when he and the editor, James Russell Lowell, discussed a name for the new publication. Lowell had accepted the editorship of the magazine only on condition that he could have Dr. Holmes as his assistant.

The Autocrat papers were followed by *The Professor* papers, which rivalled the former in popularity. It was not until twelve years later that Dr. Holmes wrote *The Poet at the Breakfast Table*, but this series did not meet with the success that accompanied the earlier efforts. However, in all three there is a brilliancy of wit and humor that has seldom if ever been equalled.

In all Dr. Holmes wrote three volumes of poems and ten volumes of prose. Many of his poems were published while he was yet a student at Harvard, from which university he was graduated with the "famous class of '29." In obedience to the traditions of his mother's family, Dr. Holmes, following his graduation from Harvard, began the study of law, but he found law uncongenial and after a year gave it up and turned his attention to the study of medicine, and soon found that he liked it. Meanwhile he dabbled in literature and it was at this time that he wrote those fervent verses, *Old Ironsides*, which saved the historic frigate *Constitution* from destruction. *Old Ironsides* was what Dr. Holmes called "an impromptu outburst of feeling" inspired by a Navy Department order that the *Constitution* be destroyed. The verses, still popular, were sung all over the country and created such a weight of public opinion that the Navy Department had to countermand its order. Dr. Holmes's first volume of poems was published in 1836, and in it was his *Last Leaf*, accounted one of the finest pieces of poetry in the English language.

After a brief experience in medicine in Boston, Dr. Holmes went to Paris in 1833 and studied under many famous physicians and surgeons. He returned to Boston two years later and established himself there permanently, with this as his motto: "The smallest fevers thankfully received," as he put it humorously in conversation with friends. He already had a wide reputation as a brilliant wit and this seemed to cause the sober minded Bostonians to doubt his medical skill. Regardless of this skepticism of the Bostonians, Dr. Holmes was a very advanced physician who made many contributions to medical knowledge. In 1843 he published

an essay on *The Contagiousness of Puerperal Fever* and a fierce controversy arose over this publication, in which Dr. Holmes was assailed by those who disagreed with him. In time, however, he came to be honored as the discoverer of this truth. In his earlier years Dr. Holmes won many prizes for professional papers and eked out his income by lecturing on anatomy at Dartmouth College. His volume of medical essays, although not so well known to the general public as his other work, contains some of his most sparkling wit, his shrewdest observations and kindest humanity. In 1847 he was appointed professor of anatomy and physiology in the Harvard Medical School and continued this professorship until 1883, when he was seventy-four years old. From about 1860 onward this was about his only link with the profession, for following the publication of *The Autocrat* in book form he devoted himself wholly to literature.

As a writer Dr. Holmes was active almost up to the day of his death, in 1894, at the age of eighty-five. His third and last novel, *A Moral Antipathy*, was published when he was seventy-five and he wrote his *Life of Emerson* when he was past three score and ten. His last volume, *Over the Teacups*, after the manner of *The Autocrat*, was begun in 1888 when he was nearly four score. His place is among the bright and happy spirits of literature and there is fair assurance that he will forever hold that place.

THE DIAGNOSIS OF RETROVESICAL HYDATID CYSTS.

Retrovesical localizations of hydatid cysts in man are relatively rare. The cyst develops in the subperitoneal connective tissue between the bladder and rectum, and being supported by the pelvic floor the cyst grows to the sides of the pelvis and upward, compressing all the structures surrounding it. Usually its evolution is slow, but as soon as urinary disturbances accrue the consequences may quickly become fatal. The rounded shape of the growth, its situation in the midline and the fluctuation frequently lead to the diagnosis of an over-distended bladder, as its upper outline may reach the umbilicus. Passage of a catheter shows that the bladder is empty or at least contains an ordinary amount of urine and the tumor will be found by rectal examination, showing its pelvic development.

In Saxahausty's case the diagnosis of sarcoma of the prostate was made and after incision of the perineum hydatid cysts were seen to issue forth. Tillaux likewise made the same diagnostic error, while Wood performed a suprapubic cystotomy for what he supposed was a hypertrophied prostate. In

Kean's case—reported by Jendy (Thesis. Paris, 1913)—the patient was a boy of seven years; the diagnosis at first wavered between a cyst of the mesentery and a cold abscess developing in the horizontal branch of the pubis, the latter conclusion having been agreed upon. An exploratory puncture was consequently made and revealed the true nature of the tumor.

Usually the clinical diagnosis of these cysts is not made unless exploratory punctures or incisions are resorted to, but in some cases a correct diagnosis is possible without these means. The functional symptoms are not sufficient to make a diagnosis, although they may lead the surgeon to suspect the real condition of affairs, but the physical signs are all important. The tumor is hard, rounded, and smooth. These signs are constant and although they are not pathognomonic when met with singly, when they are all present in the case of a tumor of the pelvis they offer strong presumption in favor of a diagnosis of hydatid cyst. Unfortunately, the only truly pathognomonic sign—hydatid thrill—is absent and we only know of one instance in which it was present, that of Tuffier referred to by Getten in his thesis (Paris, 1898). When by puncture perfectly clear fluid is withdrawn the diagnosis can be made, but sometimes the fluid does not come away, although in these circumstances the possibility of a hydatid cyst must not be eliminated. When the needle does not give issue to the fluid it is because the cyst, filled by daughter vesicles, flees from the instrument just like the intestine in cases of ascites. If fluid does not exist or has become collected in the parts it cannot be withdrawn, as for example, in Legrand's case, where a cyst existed tightly packed with hydatids. Briefly, a diagnosis can be made if hydatid thrill can be made out or when the exploratory puncture is positive; it can only be one of probability when the physical signs exist. Research for the deviation of the complement and eosinophilia should be resorted to.

INTESTINAL VERTIGO.

Like the stomach, the intestine may be the cause of the phenomena of vertigo. Glenard, Sigaud, Vincent, not to mention others, have met with them in instances of prolapse of the transverse colon with bending of the angle, in distention of the colon by gas, and typhlectasis, while Pron, Mendel, and others have reported instances of vertigo in cases of chronic enterocolitis interspersed with acute painful paroxysms. Special credit is due to Loeper, of Paris, for the report of numerous cases with radioscopic verification, examination of the

blood pressure, etc., as well as the development of a brilliant pathogenic theory.

All types of vertigo may be met with in intestinal disturbances, from simple indecision in walking to the state of *mal vertigineux*, and even Ménière's vertigo with falling and vomiting has been known to occur. Loeper records the case of a male thirty-nine years of age who had been constipated for years and who complained of an emptiness in the head, cephalic malaise and fainting whenever he went two days without a stool. For several months the constipation had increased, likewise the other symptoms, to which an ataxic gait became added. He also suffered from beating in the head, tinnitus aurium and dizziness. All these symptoms disappeared after the intestine had been emptied by oil enemata. Abdominal palpation was negative, the appetite good and the general state perfect. The ears were absolutely normal, the pupils reacted to light although greatly dilated, and the patellar reflexes were exaggerated. Blood pressure was usually found below normal, the urine rich in indican.

Another case recorded by Loeper which we give as an example of intestinal vertigo was that of a male who had followed a farinaceous diet on account of a long standing enteritis. He suffered frequently from meteorism, pain, palpitation, nausea, tinnitus aurium, and vertigo and twice he fell although consciousness was not lost. Colonic distention was verified by radioscopy while the blood pressure reached twenty-one and more when the meteorism was marked and vertigo appeared. There were appreciable lesions of the circulatory system and by a less exclusive diet, combined with pancreatin, the blood pressure dropped to sixteen and the vertigo disappeared.

Intestinal vertigo in young subjects is not serious; it is a troublesome symptom but is usually recovered from by proper treatment. In elderly people, on account of the resulting high tension, it may be the prelude to cerebral hemorrhage. According to Loeper, the vertigo is due to a variation of pressure in the semicircular canals, which may or may not be independent of the general circulation. In the first case the blood pressure is normal or below normal and a spasm or localized flux comes into play; in the second case there is a sudden hypertension of the entire circulatory system.

All these phenomena may be provoked in patients with intestinal disturbances by four principal causes, namely: The congestion of the digestive apparatus during intestinal digestion; blood plethora; absorption of toxic products or at all events vasotonic substances, and, lastly, abdominal reflex. The hypotensive action of certain

toxic products elaborated in the intestine of constipated subjects and the passage into the urine of a hypotension of intestinal origin has been experimentally demonstrated by Loeper. Vertigo from hypertension is of reflex origin.

A NEW JOURNAL.

Decrease of working hours must bring increased leisure for reading of all the marvels around us. Some, of course, are satisfied with a jerky article in the Sunday paper, or the report of a discovery, condensed to absurdity, in the daily news. In *Discovery*, which is a popular journal of knowledge, published by Murray in London, the opinion is given that the specialist, when he has told of his results to fellow workers in the usual way, should make those same results plain to the ordinary man in books, pamphlets or articles. Certainly, those papers in the first number are extraordinarily clear and well chosen, but this was to be expected, for all the leaders in science—including medicine, surgery and pathology—are on the writing staff. The journal is maintained under a deed of trust; the Presidents of the Royal Society and the British Academy being two of the trustees, and the British Psychological Society and the Royal Society of Economics on the committee of management, along with every learned society of note. Its good paper and large print are not minor virtues in these days of expensive light and efforts to read during the daily ride on rail and road.

News Items.

Mount Sinai Hospital Receives Gift.—The late Henry L. Einstein, of New York, bequeathed \$25,000 to Mount Sinai Hospital.

Additions to University of Maryland Hospital.—The University of Maryland Hospital is undertaking to raise funds to provide an obstetrical department and a nurses' home.

Prize for Ambidexterity.—The Medical School of Guayaquil, Ecuador, has offered a prize of 100 piastres to the schoolmaster who trains the largest number of ambidextrous pupils.

Plague at Galveston.—The eighth case of bubonic plague is reported at Galveston by surgeons of the United States Public Health Service, and another case is under observation.

Death of Professor Guyon.—Jean Casimir Félix Guyon, word of whose death has recently been received, was professor of genitourinary surgery at the Hôpital Necker, Paris, and for many years editor with Lancereaux of *Annales des maladies des organes génito-urinaires*. He was a member of the Institute and of the Academy of Medicine.

Radium Service at Hôtel-Dieu.—The municipal council of Paris has decided to add to the Hôtel-Dieu a radiotherapeutic department for the treatment of cancer. A gift of 40,000 francs has been offered by the *Ligue franco-anglo-américaine*, and the remainder of the cost will be defrayed by the municipality.

Dysentery in Baltimore.—An unusually large amount of dysentery has been reported during the present summer in Baltimore, and the infant death rate has been increasing.

Chicago Polyclinic to Build.—The Chicago Polyclinic is endeavoring to raise funds for a hospital building, to be erected on a site adjoining the present Henrotin Hospital.

Harvard Medical School Receives Gift.—The Rockefeller Foundation has given the Harvard Medical School \$350,000 for the development of psychiatry and \$300,000 for the teaching of obstetrics.

Canadian Anesthetists Form Society.—The Canadian Society of Anesthetists was recently formed, with the object of promoting the science, practice, and teaching of anesthesia. Dr. Samuel Johnston, of Toronto, is president.

Physical Education in France.—A bill providing for compulsory physical education of children has been passed by the French Senate. The training will begin at the age of six and in the case of boys will continue until their period of military training.

Alcoholic Cases Increasing at Bellevue.—A report of Commissioner of Charities Bird S. Coler states that cases of alcoholism at Bellevue Hospital have increased in frequency during the last few weeks until the number virtually equals that before prohibition.

Dr. Huffman Receives Appointment.—Dr. Otto V. Huffman, formerly dean and acting provost of Long Island College Hospital, has been appointed a member of the faculty of the New York Post-Graduate College and Hospital and chief of the medical clinic.

Resignation of Dr. Hyman.—Dr. Albert S. Hyman, resident physician at the Long Island Hospital, has resigned to become superintendent of the Mt. Sinai Hospital in Philadelphia. His successor is Dr. Albert B. Murphy, formerly assistant resident physician at the hospital.

Kings County Almshouse to Be a Hospital.—The Kings County Almshouse, N. Y., has been closed and will be turned into a hospital for chronic cases, to be administered by the city. About 600 chronic cases will be transferred to the new institution from the Kings County Hospital.

Personal.—Dr. L. Duncan Bulkley, of 10 East Sixty-first Street, New York, has retired from the active practice of dermatology and will devote his attention to consultation practice in the same and to the treatment of cancer.

Dr. Harry Plotz, of the U. S. Public Health Service, has recently returned to this country from Poland.

Honorary Degrees.—The University of St. Andrews has awarded the degree of LL.D. to the following men: Mr. W. J. Matheson, president of the biological laboratory of the Brooklyn Institute and chemical adviser to the New York City Board of Health; Dr. Leon Frederick, professor of pathology in the University of Liege, Belgium, and Dr. Norman Walker, inspector of anatomy for Scotland and representative of the profession in Scotland on the General Medical Council.

Interallied Conference.—The fourth interallied conference for the study of questions pertaining to war invalids will be held September 19th to 24th in Brussels.

New Westchester Hospital.—A new hospital to be known as the Valhalla Neurological Hospital will be opened October 1st at Valhalla, Westchester County, N. Y. The institution will be located on a site covering twenty-five acres and include a tennis court and athletic grounds. There are eighteen buildings. Among those on the medical executive committee are: Dr. Max G. Schlapp, professor of neuropathology at New York Post-Graduate Medical School and Hospital; Dr. John P. Grant, Dr. John J. McPhee, Dr. Emil Altman, Dr. W. I. Sirovich and Dr. Julius Broder.

Regional Health Conference in Washington.—The first of a series of regional health conferences authorized by the International Health Conference in Cannes is to be held in Washington, D. C., December 6th to 13th. It will be devoted to a consideration of venereal disease.

The conference is being organized under the joint auspices of the United States Interdepartmental Social Hygiene Board, the United States Public Health Service, the American Red Cross, and the American Social Hygiene Association. Professor William H. Welch of Johns Hopkins will serve as president.

The conference will review past experiences and existing knowledge as to the causes, treatment, and prevention of venereal diseases, and will formulate recommendations relating to a practicable three year program for each of the North and South American countries participating. In addition it will make suggestions for putting such programs into effect.

Died.

BOONE.—In Troutville, Va., on Friday, July 9th, Dr. George A. Boone, aged seventy years.

CHURCHILL.—In New York, N. Y., on Friday, August 20th, Dr. Frank Churchill, aged sixty-six years.

CLASSEN.—In Albany, N. Y., on Thursday, August 12th, Dr. Frederick Luke Classen, aged sixty-three years.

CRACRAFT.—In Wheeling, W. Va., on Monday, July 26th, Dr. William A. Cracraft, aged seventy-six years.

FLORENCE.—In New York, N. Y., on Sunday, August 8th, Dr. William Steed Florence, aged twenty-three years.

FURNESS.—In Wallingford, Pa., on Wednesday, August 11th, Dr. William Henry Furness, aged fifty-four years.

GELNEAU.—In Easthampton, Mass., on Wednesday, August 18th, Dr. Joseph Homer Gelineau, aged thirty-eight years.

HARRISON.—In Enfield, N. C., on Thursday, August 19th, Dr. Aristides Smith Harrison, aged fifty-six years.

LAASE.—In New York, N. Y., on Saturday, August 21st, Dr. Christian Frederick John Laase, aged fifty-one years.

MCDOWELL.—In Butternut, Va., on Thursday, July 29th, Dr. Ivan W. McDowell, of Savannah, Ga., aged thirty-five years.

MURPHY.—In Elmira, N. Y., on Tuesday, August 7th, Dr. Daniel P. Murphy, aged forty-six years.

WAGNER.—In Warrensburg, N. Y., on Sunday, August 8th, Dr. Edward Wagner, aged fifty-one years.

WESSELHOEFT.—In Cambridge, Mass., on Tuesday, August 17th, Dr. Walter Wesselhoeft, aged eighty-two years.

Book Reviews

PRINCIPLES OF ANTENATAL AND POST-NATAL PHYSIOLOGY.

The Principles of Antenatal and Postnatal Child Physiology, Pure and Applied. By W. M. FELDMAN, M.B., B.S. (Lond.), Assistant Physician and Lecturer on Child Physiology at the Infants' Hospital. Illustrated. London and New York: Longmans, Green & Co., 1920. Pp. xvii-691.

This is a comprehensive study of the physiology of the fetus and child. Too little has been offered in this field, but now we are rewarded by a splendid textbook that may be said to be a solid foundation for further building. Perhaps our studies of physiology originated from a curious introspection similar to that revealed in the life of Leonardo da Vinci and we did not readily realize the importance of the study of the infant and fetus. Here, indeed, if we are to build a rational structure, should the beginning be made. Another reason for lack of study in this domain has been the lack of financial remuneration in treating an unborn fetus. It would seem that at best the study was an abstract one. But this is not true, for a comprehensive understanding of the underlying dynamics would clarify many of the obscure phenomena encountered in later life.

Until recent years pediatrics was not considered a special subject. Jacobi, in this country, was one of the pioneers who gave pediatrics a separate place in the world of medicine. At present we are aware that the physiology of childhood differs from that of adult life. The pathological conditions are different. The bodily proportions, and bodily changes in growth and nutrition are not the same. Then we also have the transitory stages at the time of birth and during the period of adolescence. During these times vast physiological changes occur. As physicians it is our duty to try and know more about them. In Feldman's book many of these processes are described, among them some to which we have given little consideration in the past.

Heredity and the germinal stages are considered, as well as the physiology of conception. A broad working concept of heredity is presented. This is then followed by the postconceptional or intrauterine stage. Of vital importance are the chapters on general physiology, metabolism, and the mechanics of development. New light is shed upon fetal secretions, excretions, and the biodynamics of growth. The physiology of pregnancy is discussed in detail, and this portion of the book should interest the obstetrician and gynecologist, for the concomitant changes in the maternal organs are also considered. Then comes a detailed and well presented account of the latest findings of the postnatal stage. The various systems are considered one by one and in their relation to one another. At no time does the author lose sight of the organism as a whole. This, unfortunately, is a too frequent occurrence when laboratory workers attempt to present their findings. The special senses are taken up separately and are given the emphasis they require.

For the endocrinologist, there is a chapter devoted to the internal secretions. This is followed by an account of the changes during puberty and postnatal growth. The book is written in an interesting manner and this brief survey should show the many fields in which the book will be found of value.

AUTOEROTIC PHENOMENA.

Autoerotic Phenomena in Adolescence. An Analytical Study of the Physiology and Psychopathology of Onanism. By K. MENZIES. With a Foreword by ERNEST JONES, M.D. New York: Paul B. Hoeber, 1920.

This is a most valuable monograph. The subject of masturbation has usually been discussed with more reluctance than that of any other phase of sex. Menzies shows that not until Freud's analytical approach was it possible to give a correct interpretation to the general subject of autoerotic phenomena. Many ills of mankind have been attributed to masturbation, and men accredited with wisdom by virtue of their position or of degrees given them have spoken of masturbation as a vice. In the light of the new psychology, we are shown that autoerotic manifestations are phases of human development and not perversions. There are many erogenous zones besides the genitals and in early infancy these are made the region of autoerotic enjoyment. Thumb sucking, the retention of feces and urine, rubbing the thighs together, and many similar performances are all a part of the process. Much suffering and shame have been caused by the lack of knowledge surrounding this subject; neurotic symptoms are a common result of the fearful warnings and of the quack literature that has dealt with this subject in the past. We are now able to consider the autoerotic manifestations as one of the primary or infantile states in sexual development. Then comes the homosexual phase, which is finally supplanted by the heterosexual or complete love life. Menzies shows that masturbation continued over a long period is injurious inasmuch as it interferes with the appreciation of the normal sex life in later years. In women the zone of the clitoris predominates and it is only with difficulty that the transfer of the zone of excitation is made to the vagina. This accounts for the number of so-called anesthetic women. In the male the habit leads to premature ejaculation and does not allow for the full enjoyment of the normal sex act. This in turn is harmful to the female, for it does not permit her the degree of excitation necessary to produce an orgasm. This condition may lead to various neuroses, anxiety neurosis being a common sequel.

Max Hühner is quoted at some length. He believes masturbation to be caused mainly by an irritation of the deep urethra. This sounds plausible but is not true in the majority of cases. Hühner cites many cures which have been effected by massage and instillations of silver nitrate in the deep urethra. He may have found this condition in a number of patients, but surely he cannot logically believe that the great proportion of males who

masturbate have an irritation of the deep urethra. If he were to give the subject further consideration and observe the situation outside his treatment room, he would find that he was considering only a small number of masturbators. In order to understand the process in its entirety he would be obliged to accept the broader psychological concept of an evolutionary process in the development of the sexual cycle.

The monograph is an excellent one, for Menzies has quoted freely from Pfister, Freud, Jung, Hall, Jones, Ferenczi, Forel, and Havelock Ellis and has presented their views in an understanding fashion. In fact he has done little else but quote, but he has done it well. The book is timely and worthy of study.

A PSYCHOLOGICAL STUDY OF LIFE IN THE GHETTO.

Sarah and Her Daughter. By BERTHA PEARL. New York: Thomas Seltzer, 1920.

There is much of the sordid side of New York life in this book. The story, however, is lifted to the level of compelling interest by its truth and the fine appreciation of the individual struggle with which tragedy is met. To refuse to enter into such painful realism is to shirk the responsibility of its existence.

There are two sweeping forms of difficulty that lie at the bottom of the tragic experiences dragged through the lives of Sarah and the daughter. One is the economic maladjustment of society which permits of crushing pressure upon lives that ask merely free opportunity for themselves in their toil and in a modest selfdevelopment. Sarah and her family failed to find even such freedom to work until she was tempted to a misappropriated freedom in money making which again made slaves of herself and children. Poverty, sickness, dirt—these things were made to press their weight upon a spirit originally of too fine material to breathe beneath them. The only aid society was able or willing to render was to compress this already unbearable load under a falsely constructed protectiveness where individual expansion was the last thing to be conceived. It is an oft repeated tale, alas, this careless method of throwing an occasional sop to conditions fundamentally wrong. In this story Sarah and her daughter and all their associates are in one way or another victims of bad industrial conditions. Some of them achieve a victory of selfdevelopment which raises them above their original environment, but each one bears in one way or another the marks of social compression and attains a hampered success.

Below the broad economic basis for these individual histories is the profound psychology of the struggles which issue partially in defeat, partially in victory. Bertha Pearl's touch has the sureness of the artist who, while not always conscious of the psychological implications of her words, yet touches, however fleetingly, those ultimate sources which the clumsier scientist labors to define. The name of the book itself carries suggestiveness. The mother daughter theme here bears its own interpretation. Sarah's native refinement

is blunted by the duller religiosity of her inefficient husband and is pierced by reproach deeper than that of having been untrue to herself in the fact that she did not follow the true lover in the homeland. Such a nature with such a history is especially sensitive to the rivalry of a daughter like herself, whom she both loves and fears. The embittered woman possesses in Minnie a daughter of rare sweetness of character but of a greater sincerity than Sarah had been able to maintain. From Minnie's early childhood mother and daughter present a touching interplay of love. The mother depends upon the child's native tenderness and helpfulness and yet throws up that stubborn defense with which such natures shield their own deficiencies. The hatred of selfdefense and selfaccusation by the time the girl has reached puberty comes to separate hopelessly mother and daughter. The latter develops a brave endurance under hardship and temptation; the mother to the end is torn between blame to herself and perplexity over a need for independence in her child which she cannot quite define.

No less finely suggestive is the psychology that touches the other characters of the book. The story in its study of these struggles through a sordid environment and with underlying psychic burdens is so realistically human that one need not seek in it the register of either complete success or complete failure. Its review of social facts as well as of the human conflict in which the rich share with the poor should recall the reader to a double need. One cannot lay down the book as indifferent as before to the defects of our world with its hardest pressure upon such lives as these. Neither can one remain unappreciative of the necessity of deeper psychological knowledge. There are such sensitive souls as these on the East Side as on the West. The psychic maelstrom of hidden antagonisms and misunderstandings as well as of hidden powers sweeps beneath many such poignant situations as that of Sarah and her daughter. One must to a certain extent suffer with them in reading these pages. One will be rewarded, however, by finding two characters especially worth knowing. One may not pity them too much or find cause to blame, but one will love both Sarah and her daughter.

INDUSTRIAL PSYCHOLOGY.

Lectures on Industrial Psychology. By BERNARD MUSCIO, M.A. (Sydney); M.A. (Conville and Caius College, Cambridge); Late University Demonstrator in Experimental Psychology, Cambridge, etc. Second Edition, Revised. New York: E. P. Dutton & Co., 1920. (London: George Routledge & Sons, Ltd.) Pp. iv-300.

The intelligent young artisan, who reads such works as these much more than is imagined, is beginning to cast a suspicious eye on those learned men who want him to work in the position best fitted to his ability and to grant him all those recreationary periods which Nature has declared necessary for sagging nerves and the mischief wrought by noise and the ghastly monotony of repetition. Is it, he asks, that he may know the gorgeousness of life, may conquer the daily task himself unconquered? Or has the economy of mercy been discovered, have the future returns of scientific management been seen as more profitable than the

immediate ones of continuous work at high pressure?

Then again, in his irrational way, he asks what will be done with the incompetent whom it will take a long, long time to convince that the new is the best, who is wholly bent on contesting each inch of ground with the insistent monster, machinery? Is it not possible that a few competent may do the work of many stunted in mind and body and the question of employment prove a tougher one than ever for philanthropists and employers? Labor saving, energy saving must be translated into the workman's own language. Our next step must be to prove that all the gain will not be on the employer's side, nor behind the apparent relief from hard labor will there lie ambushed the same old enemies of want and sickness and old age. A feeling of fear, leading to hostility, has come. "Organized labor has declared that scientific management is essentially autocratic, a reversion to industrial autocracy which forces the workers to depend on the employer's conception of fairness and justice, and limits the democratic safeguards of the workers."

Now for an absolutely fair discussion of what psychology can do in the labor world, of what it can do in the way of obviating accidents to the public and to workmen, of increasing the amount of work while diminishing fatigue and time taken, it would be difficult to find a wiser volume than this, for no point is too small to discuss and elucidate when it will lead to a clearer understanding of all that seems so obvious to us, so entangled to the working man.

THE WORK OF THE RED CROSS.

The American Red Cross in the Great War. By HENRY P. DAVISON, Chairman of the War Council of the American Red Cross. Illustrated. New York: The Macmillan Company, 1920. Pp. i-302.

It is so often thought that everyone knows about the Red Cross, that no one thinks it worth while to let anyone know how things began. Who knows that the American National Red Cross was permanently incorporated in 1905 with the President as president? Who knows of the eager, tempestuous giving which formed its early share in the war, or the generous help given the troops on the Mexican border, where 75,000 men rehearsed the drama and learnt a few of the hardships awaiting them overseas?

The author has wisely kept the work in each country separate, for this is a work of reference, not merely a collection of anecdotes or things remembered, and the last chapter reminds us that the Red Cross, now figuring as a section of the League of Red Cross Societies, founded May 5, 1919, is toiling away at the weary task of clearing up after the war. The still greater task awaits it of promoting the welfare of mankind by furnishing the medium for bringing within the reach of all peoples the benefits to be derived from present known facts and new contributions to science and medical knowledge and their application, and to coordinate relief work in case of great national or international calamities.

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

RELIGION AND THE NEW PSYCHOLOGY. A Psychoanalytic Study of Religion. By WALTER SAMUEL SWISHER, B.D. Boston: Marshall Jones Company, 1920. Pp. xv-261.

REPORT FOR THE YEAR 1919 OF THE CANTON HOSPITAL. Canton, China: Canton Medical Missionary Society and the Canton Medical Missionary. Pp. v-120.

BIBLICAL STUDIES. Moses the Founder of Preventive Medicine. By PERCIVAL WOOD, M. R. C. S., L. R. C. P., Captain, R. A. M. C., Author of *The Whole Duty of the Regimental Medical Officer*. New York: The Macmillan Company, 1920. (London: Society for Promoting Christian Knowledge.) Pp. xi-116.

TUBERCULOSIS AND PUBLIC HEALTH. By H. HYSLOP THOMSON, M. D., D. P. H., County Medical Officer of Health, County Tuberculosis Officer and School Medical Officer for Hertfordshire; Formerly Tuberculosis Officer for Newport and East Monmouthshire, etc. New York and London: Longmans, Green & Co., 1920. Pp. xi-104.

AN EPITOME OF HYDROTHERAPY. For Physicians, Architects and Nurses. By SIMON BARUCH, M. D., LL. D., Consulting Physician to Knickerbocker and Montefiore Hospitals; Hydrotherapeutist to Sea View Hospital for Tuberculosis, etc. Illustrated. Philadelphia and London: W. B. Saunders Company, 1920. Pp. ii-205.

MARINE HYGIENE AND SANITATION. A Manual for Ships' Surgeons and Port Health Officers. By GILBERT E. BROOKE, M. A. (Cantab.), L. R. C. P. (Edin.), D. P. H., F. R. G. S.; Chief Health Officer, Straits Settlements Medical Department; Port Health Officer, Singapore, etc. Illustrated. New York: William Wood & Co., 1920. Pp. ix-409.

THE SYMPATHETIC NERVOUS SYSTEM IN DISEASE. By W. LANGDON BROWN, M. A., M. D. (Cantab.), F. R. C. P. (Lond.), Physician with Charge of Outpatients, St. Bartholomew's Hospital; Physician to the Metropolitan Hospital, etc. Illustrated. London: Henry Frowde, Hodder & Stoughton, Ltd. (Oxford University Press), 1920. Pp. xi-161.

TREATMENT OF THE NEUROSES. By ERNEST JONES, M. D. (Lond.), M. R. C. P. (Lond.); President of the British Psychoanalytic Society; Member (for England and America) of the Council of the International Congress for Medical Psychology and Psychotherapy; Honorary Member of the American Psychopathological Association. New York: William Wood & Co., 1920. Pp. viii-233.

FUNCTIONAL NERVE DISEASE. An Epitome of War Experience for the Practitioner. Edited by H. CREIGHTON MILLER, M. A., M. D., Formerly Medical Officer in Charge Functional Cases, No. 21 General Hospital, Alexandria; Late Consulting Neurologist, Fourth London General Hospital. London: Henry Frowde, Hodder & Stoughton, Ltd., (Oxford University Press), 1920. Pp. xi-208.

SELF HEALTH AS A HABIT. By EUSTACE MILES, M. A., Formerly Scholar of King's College, and Honors Coach and Lecturer at Cambridge University; Assistant Master at Rugby School; Amateur Champion at Racquette and Tennis; Author of *How to Prepare Essays, How to Remember*, etc. Illustrated. New York: E. P. Dutton & Co., 1919. (London and Toronto: J. M. Dent & Sons, Ltd.) Pp. v-341.

A STUDY IN THE EPIDEMIOLOGY OF TUBERCULOSIS. With Especial Reference to Tuberculosis of the Tropics and of the Negro Race. By GEORGE E. BUSHNELL, Ph.D., M.D.; Colonel, United States Army Medical Corps (retired); Honorary Vice-President and Director National Tuberculosis Association of the United States; Member American Climatological and Clinical Association. Illustrated. New York: William Wood & Co., 1920. Pp. v-221.

Practical Therapeutics and Preventive Medicine

A Compendium of Treatment and Prophylaxis, Original and Adapted

Chronic Knee Strains.—H. Page Manck (*Virginia Medical Monthly*, April, 1920) comments on the frequency with which acute knee strains remain inadequately treated, chronic sensitiveness of the joint resulting. The joint should be fixed for four or five weeks, preferably on a posterior splint, so that after the first week daily massage of the thigh muscles can be practised. Exercises of these muscles, care being taken to allow no lateral motion, are very beneficial after the second week. Such treatment of the acute injuries would result in far fewer chronic traumatic knee joints. In the chronic cases the subjective symptoms are recurrent attacks of synovitis with or without locking, and the important objective symptoms, increased lateral mobility, tenderness over the injured ligament or cartilage, possibility of palpation of the cartilage in some cases, and atrophy of the muscles of the thigh. Of 159 cases collected by the author, of which only twenty-one apparently received any greater amount of treatment than rest and bandaging with or without local applications for a few days, 136 showed an atrophy of over half an inch of the thigh on the affected side. In cases with a history of repeated locking, operation for removal of a loose cartilage or loose body is indicated, with aftertreatment the same as in cases without locking. This treatment aims first at protection against recurrence, allowing the lateral ligament and synovia to recover and developing the supporting muscles. Effusion indicates rest in bed with snug bandaging until it has subsided. After this it is essential to prevent lateral mobility, an object secured by elevation of the shoe on the inner side and the application of a properly fitting brace, such as the Campbell knee brace or the knee cage devised by Robert Jones.

To prevent muscular atrophy and thus stabilize the joint there must be daily massage with systematic exercises, especially of the quadriceps; the latter is readily carried out by having the patient sit on a table with his legs hanging over the edge, simple flexion and extension bringing the muscles into play; a weight on the foot may be added. Bristow recommends graduated contractions of the thigh muscles with the Bristow coil. The elastic kneecap often prescribed in these cases is useless and even harmful in that it does not prevent lateral mobility but interferes with free use of the muscles. Cases with extreme lateral mobility require an operation on the internal lateral ligament, which is to be reinforced with the semimembranous or sartorius, as advised by McMurray. In cases with a bruised or hypertrophied infrapatellar pad the principal symptoms are recurrent synovitis with pain on complete extension and definite tenderness over the pad. Conservative treatment consists of fixation in slight flexion for a few weeks, followed by elevation of the heel of the shoe by one inch, which prevents pinching of the pad during locomotion. Good results have followed operative removal of the hypertrophied and bruised pad.

Ligation of the Common Carotid.—John Homans (*Annals of Surgery*, June, 1920) in describing a case of ligation of the carotid and in a review of the literature on the subject presents the following conclusions. If an injury to the common carotid is suspected, the patient should be studied with a view to determining the quality of the emergency collateral circulation; that the operator should consider the strength of the arterial circulation, as demonstrated by the blood pressure and the apparent degree of shock, or its absence; that he should not undertake the procedure in the absence of signs of dangerous extension of the local hematoma and in the absence of external hemorrhage, unless all the circumstances appear favorable for the resumption of a collateral cerebral circulation; that he should be prepared for the temporary or permanent repair of the common carotid in case temporary occlusion induces immediate cerebral symptoms; that he should ligate the jugular vein before or during occlusion of the artery; that he should be prepared to give blood transfusion to the patient; that he should use an anesthetic the least disturbing to the heart and to the brain—in other words, that local anesthesia should be used wherever possible; and that in case immediate operation is for any reason delayed, he may properly expect a greater likelihood of injury to adjacent nerves, but a far lower incidence of cerebral complications.

The Treatment of Empyema.—Evarts A. Graham (*Surgery, Gynecology and Obstetrics*, July, 1920) states that:

The extensive recent literature on empyema reveals both a striking tendency toward a more or less standardized treatment and a radical departure from methods in use prior to the war. The cardinal principles of, 1, the avoidance of an open pneumothorax during the acute pneumonic stage of the disease, 2, early sterilization and obliteration of the cavity, and 3, the maintenance of the nutrition of the patient, are discussed in this article. It is shown that the former prevalent conceptions of the mechanism of action of an open pneumothorax are incorrect.

In the normal thorax the mediastinal structures, instead of constituting a more or less rigid partition between the two pleural cavities, are in reality so mobile that to air pressure they offer a resistance which is equivalent to the pressure exerted by a column of water only one half centimetre to one centimetre high (.4 millimetre to .8 millimetre of mercury). This resistance is therefore negligible and from the point of pressure relationships, the thorax can be considered as one cavity instead of two. Any change of pressure, therefore, in one pleural cavity will manifest itself to practically the same degree in the other pleural cavity with the result that both lungs will be about equally compressed. The situation in this respect is the same in the dog as in the human, and, there-

fore, experimental results obtained on the dog can be directly applied to the human.

The likelihood of a fatal asphyxia as a result of an open pneumothorax depends upon a number of factors, important ones of which are the size of the opening and the vital capacity of the individual. A mathematical expression has been devised by which it is possible in a given case to approximate the maximum nonfatal opening in the chest wall if the vital capacity is known. One who has an average vital capacity and a normal thorax can withstand an opening in the thoracic wall of fifty-one square centimetres, but the individual of exceptional vital capacity can live with an opening of one hundred and one square centimetres. A bilateral open pneumothorax is practically no more dangerous to life than a unilateral opening provided that in each case the areas of the openings are the same. If the vital capacity is so low as to approximate the tidal air, even a very small opening may be fatal.

As shown in the text, these observations have a very important bearing on the question of open drainage of cases of empyema, particularly during the acute pneumonic stage when the vital capacity is low. After adhesions have formed and the mediastinum has become somewhat stabilized, both by adhesions and inflammatory induration, then the pressure relationships may be materially different on the two sides.

Effects of an open pneumothorax other than those directly upon the lungs are briefly considered, such as heat loss, changes in the systemic circulation and danger of infection. The value of Dakin's solution in sterilizing and obliterating empyemic cavities is shown, as well as its power to decorticate lungs. Collapsing thoracoplastic operations have the disadvantage, even when successful, of apparently permanently reducing the vital capacity. The maintenance of the nutrition of the patient is of fundamental importance.

Suprapubic Prostatectomy.—T. L. Deavor (*American Journal of Surgery*, July, 1920) mentions the following points in favor of suprapubic prostatectomy: The entire field is open to inspection, and within easy reach. Reflected light may be used. Rectal pressure elevates the prostatic region. In case of marked sepsis, it is the first step in a two stage operation. Complications, as hemorrhage, stone and prostatic bar, are more easily managed. The gland is just as accessible, and perhaps more so. Enucleation is very simple. The rectum may be as safely protected. No more damage need be done to the prostatic urethra, if due care is exercised. Drainage both ways is readily applied. Retrograde catheterization may be used, when it is impossible to reach the bladder by the ordinary way. A catheter may be fixed in position, to remain for the entire period of drainage. During the process of recovery, the wound is well placed for subsequent treatment away from the rectum, adding much to the comfort of the patient. Except in carcinoma, a fistula following this method is almost unknown. Should it occur, obliteration is always possible. The mortality should not be increased.

Röntgen Rays in Obscure Conditions.—George E. Pfahler (*International Journal of Surgery*, June, 1920) gives the following conclusions as to the uses of the x ray in diagnosis:

1. The röntgen rays are useful in the diagnosis of practically all obscure conditions in the body.

2. The organ involved is not always indicated by the character of the symptoms, and frequently an x ray study must include more than the organ to which the symptoms refer.

3. For accurate diagnosis it is essential that good röntgenograms be made, but much greater skill and a wider scope of knowledge are needed in their interpretation than in their making.

4. The purchase of an x ray outfit no more makes the röntgenologist than does the purchase of a set of surgical instruments make a surgeon.

Anesthetics in Shock.—McKean Cattell (*American Journal of Surgery*, July, 1920) gives the following summary of the experimental studies which were conducted on the effect of anesthetics in shock:

1. In the normal animal, ether, rapidly administered, causes a moderate fall in blood pressure, followed immediately by a recovery, so that by the time a degree of anesthetization is reached sufficient to cause a disappearance of the eye reflex, the pressure is normal. In shock the animal becomes very sensitive to ether, the same degree of anesthesia produced under exactly similar conditions resulting in a marked drop in blood pressure.

2. An increased sensitiveness to ether is brought about by any circumstances which tend to depress the general condition of the animal such as low blood pressure, hemorrhage, severe operation, or the injection of acid into the circulation.

3. In a shocked animal, sensitive to ether, nitrous oxide and oxygen may be given in the most favorable proportions, so as to produce the same degree of anesthesia produced by ether without causing a fall in blood pressure.

4. Experiments on the heart volume in intact cats, and on contractions of the isolated turtle heart, together with deductions from blood pressure, show that ether, from the very beginning of its administration, results in a depression of the heart and a decrease in its output, which is sufficient to account for the fall in pressure in both the normal and the shocked animal.

5. Large doses of adrenalin injected intravenously in shocked animals usually result in the disappearance of the sensitiveness to ether for a period of an hour or more. The evidence indicates that adrenalin acts on the heart in a manner which antagonizes the effects of ether. Pituitrin does not influence the pressure drop produced by ether in the shocked animal.

6. Determinations of leg volume with a plethysmograph, perfusion experiments, and results obtained from the injection of ether directly into the circulation, together with the form of the blood pressure curves, indicate that ether causes a contraction of the peripheral vessels in the normal animal. This constriction is caused, a, by a direct stimulation of the vasomotor centre and, b, by a reflex to the fall in pressure resulting from depression of the heart. In shock no evidence of a vasoconstriction produced

by ether was obtained, and pressor effects from asphyxia or sensory nerve stimulation become less or are entirely absent.

7. The cause of the greater depressing influence of ether on the blood pressure in shock is a disturbance of the vasomotor system. The usual compensatory constriction no longer occurs to offset the decreased output of the heart, so that there is no recovery of the blood pressure during the inhalation of ether, but instead, the pressure continues to fall. This might be due to a depression of the vasomotor centre or to an already existing maximum constriction, so that there would be no compensation.

Local Anesthesia in Rectal Surgery.—E. Jay Clemons (*Medical Council*, April, 1920) considers the postoperative advantages of quinine urea hydrochloride anesthesia in anorectal surgery to be as follows: First, being nontoxic there is no reaction. Second, as there is no interference with blood pressure there is no need to use drugs to block off absorption. Third, the drug being a mechanical irritant it causes the production of a plastic exudate which helps repair and prevents postoperative oozing. Fourth, this exudate having been thrown out and absorbed, a barrier is produced which enables the operator to get his patient on his feet while the repair is taking place. Fifth, there is produced a postoperative anesthesia for a week to ten days which is very grateful to the patient.

Cæsarean Section Under Local Anesthesia Combined with Morphine and Scopolamine Narcosis.—Frederick C. Irving (*Boston Medical and Surgical Journal*, June 3, 1920) says that Cæsarean section under local anesthesia combined with morphine and scopolamine narcosis is a useful and successful method of delivery in some of the graver complications of pregnancy. Among these are cardiac disease where one or more attacks of decompensation have occurred, diabetes, nephritis and cardiorenal disease, pulmonary tuberculosis, and bronchial asthma. In general it finds its application in those cases where we wish to avoid the pain and physical exertion of labor, the possible shock of an operative pelvic delivery, and the danger of a general anesthetic. Plenty of time must be allowed for both the general medication and the local anesthetic to act. Deliberate operating, with studious avoidance of roughness, is essential to success.

Benzylcarbinol as a Local Anesthetic.—A. M. Hjort and J. T. Eagan (*Journal of Pharmacology and Experimental Therapeutics*, November, 1919) describe an investigation of benzylcarbinol, or betaphenylethylol, also known as rose oil or orange oil. It is a volatile oil with a roselike odor occurring in nature in the volatile oils of roses, orange flowers, and pine needles. Its local anesthetic properties were studied by comparative tests with phenmethylol (benzyl alcohol) and with procaine (novocaine.) As determined by the wheel method, the local anesthetic power of rose oil seemed slightly superior to that of benzyl alcohol and procaine. It is more stable than benzyl alcohol. Its toxicity in white mice and the dog is about

the same as that of benzyl alcohol. One of the authors injected one mil of a one per cent. solution of rose oil subcutaneously in the volar surface of the forearm. The area became anesthetic to needle pricking for a period of five minutes. The solubility of rose oil is relatively low—about two per cent.—but is sufficient for its therapeutic use. It is cheaper, less toxic, and more stable than procaine. It is a commercial product found on the market regularly, being used in the manufacture of perfumes. It anesthetized the skin in a one fortieth per cent. solution in thirteen out of twenty-one cases.

Ethyl Chloride Anesthesia, Brief or Prolonged.—H. Abrand, (*Presse médicale*, May 5, 1920) recommends the use of Camus's mask for ethyl chloride anesthesia, but supplements it with a new device to permit precise regulation of the dose of anesthetic as well as the use of a single, graduated ethyl chloride ampoule of any desired size. No cooling device is required and the anesthesia may be begun with small amounts and later pushed as required. The patient, even if an inveterate alcoholic, goes under without any period of excitement and only rarely vomits upon awakening. Ethyl chloride anesthesia should be induced gradually to avoid choking sensations and possible acute toxic effects. Administration of small amounts may be repeated indefinitely, as the product is of relatively low toxicity and is quickly eliminated. Anesthesia should be obtained with a dose not exceeding one to three mils in children and three to five mils even in large adults. The anesthesia is maintained more and more easily as it is prolonged. The dose after induction in prolonged anesthesia is only about one half a mil a minute. Many extensive operations, such as arthrotomy, Estländer operations, arm and thigh amputations, and radical hernia operations, have been successfully performed under prolonged ethyl chloride anesthesia by the author and others. The anesthesia is not as deep as with chloroform, yet is wholly sufficient. The patients do not strain and radical cure of hernias is in no wise hindered. About eight to ten minutes after the induction the patient's face begins to perspire. The mask is then slightly raised to admit a little air. The color of the lips and ears is used as a guide. Not infrequently after ten to fifteen minutes the anesthetic may be completely suspended and the mask removed for a minute or two. At the first signs of returning consciousness, the patient is soon brought back into complete anesthesia. The final awakening is rapid and is at times attended with regurgitation of bile which, however, does not recur. The patient is always completely conscious when put back in his bed. One patient with an arm amputation wanted to walk back to bed.

Late Deaths from Chloroform in Liver Disease, Especially Cirrhosis of the Liver.—Fr. Brunner (*Schweizerische medizinische Wochenschrift*, June 17, 1920) urges a careful testing of the functions of the liver and kidneys by the usual methods before entering upon an operation on the biliary passages, especially when there is any suspicion that these functions have been diminished.

Miscellany from Home and Foreign Journals

Inflammations of the Nervous System.—Lewellys F. Barker, Ernest S. Cross, and Stewart V. Irwin (*American Journal of the Medical Sciences*, March, 1920) in discussing epidemic acute and subacute nonsuppurative inflammations of the nervous system prevalent in the United States in 1918-1919, encephalitis, encephalomyelitis, polyneuritis, and meningoencephalomyeloneuritis, state that the onset may be sudden or gradual, with or without prodromata. The most striking symptom, when present, is a drowsiness, which may vary in degree from apathy to coma. Some patients do not have this symptom. A patient may be drowsy in the day and wakeful and restless at night. Other disturbances include mental depression, anxiety, delirium, headache, vertigo, tachycardia and vomiting. Fever may or may not be present. A slight optic neuritis may occur, but choked disc was not seen.

Focal symptoms are motor rather than sensory. Commonest are bilateral nuclear and radicular paralyzes of the eye muscles, with ptosis and ophthalmoplegia externa et interna, but pontile and bulbar nuclear and radicular paralyzes, with facial paralysis, dysmasesis, dysphagia, or dysarthria, are common, as are symptoms that point to paralysis of part of the extrapyramidal motor system. The lesions that are most frequent as causes of motor focal symptoms must be located in the mid-brain about the aqueductus cerebri; the pons and upper medulla oblongata, and the basal ganglia. Less common are monoplegias, hemiplegias, diplegias, aphasias, contractures, choreatic and athetotic disturbances of motility and general or circumscribed convulsive seizures. Only in relatively few cases are there clinical signs of an outspoken meningeal irritation. The cerebrospinal fluid is clear and may or may not be under increased pressure. In the writer's experience, a cell count in the cerebrospinal fluid of from ten to one hundred small mononuclears along with a positive globulin reaction, with negative Wassermann, and negative bacteriological smears and cultures is, at the time of an epidemic of encephalitis, strong corroborative evidence of the disease in a patient in whom the process is for any other reason suspected to exist.

The blood usually presents a slight leucocytosis. A trace of albumin and a few casts are sometimes found in the urine, but the renal function appears to be unimpaired. Whether the disease terminates in death or in recovery, the course may be either brief or prolonged. In fulminant cases death may occur in a few days or hours. In many instances, both mild and severe, recovery has been rapid, the symptoms lasting from a few days to a month, but in the majority the disease is protracted, extending over several weeks or months. The prognosis as regards life is better than might have been expected. The mortality has varied in different countries and seems to have been greatest in Austria and France; in the series reported here there were no deaths. No definite statement can yet be made as to residues and sequelæ. The bacteriology of the disease is uncertain as yet. As regards treat-

ment the writers state that at the onset rest in bed, protection from external stimuli of all kinds, laxatives, bland diet, and relief of headache and pains, would seem to be desirable. In their experience lumbar puncture, done for diagnostic reasons, relieved the symptoms so markedly in several instances that it was repeated at intervals as a therapeutic measure. During convalescence, prolonged rest, careful nursing, a nutritious diet, and mild hydrotherapy, electrotherapy, and massage have been the only measures made use of. Complete recovery without residuals seems to be common.

Transmissibility of Lethargic Encephalitis.—A. Netter (*Bulletin de l'Académie de médecine*, April 27, 1920) reports a number of instances in which the source of infection in lethargic encephalitis could be definitely traced, and concludes that the disorder is certainly a transmissible disease, though the risk attending contact with such cases is relatively slight. The virus is probably carried in the salivary secretion. In view of the prolonged persistence of the virus in the nerve centres, the patient must retain for a long time the capacity to transmit the disease. Considerable evidence is at hand to the effect that encephalitis may be transmitted to another person by a convalescent. There is also reason for believing that the disease may be acquired through contact with a subject harboring an incomplete—fruste—or larval form of the disease, or even from a healthy person who has been in contact with a patient. All these considerations, some established and others merely probabilities, render advisable an attempt to detect and record all actual or suspected cases of the disease. Persons in contact with patients should be warned of the possibility of direct or indirect acquisition of the disease. Isolation of all patients is, however, difficult to secure at the present time.

Ocular Manifestations in Lethargic Encephalitis.—F. de Lapersonne (*Bulletin de l'Académie de médecine*, April 27, 1920) insists that ocular paralyzes are equally as important as somnolence from the standpoint of diagnosis. Frequently, however, the eye symptoms are difficult to detect, requiring a special ophthalmological examination. In patients confined to bed when first seen, the ocular paralyzes may have already disappeared—being fugacious and migratory—only to reappear a little later on; or, the seriousness of the general condition may not permit of the functional examination required for the detection of diplopia or paralysis of accommodation. Ambulatory patients nearly always consult ophthalmologists because of their eye disturbances, yet seldom reach the oculist when the disease is in its incipiency, the infection having been overlooked and the disorder ascribed to grippe or food intoxication. In some instances the infection has been duly recognized and treated, and the patients come because of visual disturbances persisting as sequelæ to the disease. Ptosis and sometimes diplopia are the most striking manifestations. Neuroretinal lesions have never as yet been ob-

served, save in cases of coincident syphilis and encephalitis. The oculomotor nerve is that most commonly affected, a special feature being that its involvement is of a fragmentary, partial type. A single muscle may be alone involved, and incompletely at that. Chauffard has laid stress on an incomplete unilateral or bilateral ptosis, only part of the cornea being covered. The patients do not attempt to react to the ptosis by throwing the head back or contracting the frontalis muscle. The internal rectus is often only incompletely involved and external strabismus is not always apparent, crossed diplopia resulting. Nystagmoid jerks rather than true nystagmus are present. At times limitation of vertical movements of the eye may be observed. In several instances the author noted unilateral internal ophthalmoplegia, evidenced by mydriasis and paralysis of accommodation. Complete or incomplete paralysis of accommodation, unilateral or bilateral, may likewise be present alone; this condition may strikingly reproduce certain paralyzes of accommodation witnessed after diphtheria or in botulism. The external oculomotor is more rarely involved, though the author has seen one apparent case of such involvement. No instance of independent paralysis of the patheticus has been reported. Apart from the manifestations due directly to nuclear or infranuclear involvement of the motor nerves there may also occur other forms of paralysis. One patient showed paralysis of convergence in spite of preservation of motor power in the two internal recti. Cantonnet saw a patient with conjugate deviation of the eyes. These cases show that the pathological lesions of encephalitis may involve the oculomotor pathways in their corticomesecephalic or supranuclear course.

Disturbances of the Reflexes in Lethargic Encephalitis.—G. Guillain (*Bulletin de l'Académie de médecine*, February 24, 1920) found the tendon reflexes greatly disturbed in three out of six well marked cases of lethargic encephalitis. The patellar, Achilles, mediopantar, posterior tibiofemoral and posterior peroneofemoral reflexes were all abolished in these patients. In the upper extremities, the stylo-radial, radiopronator, ulnopronator, flexor, biceps, and olecranon reflexes were likewise lost. In one of the other cases, dissociation of the tendon reflexes of adjacent spinal segments was noted. The right lower limb showed merely diminution of the patellar, Achilles, mediopantar, and posterior tibiofemoral reflexes, while the posterior peroneofemoral reflex was alone abolished. In the left lower limb, the latter reflex was likewise lost, but the other four were normal. In the upper extremities of the same patient the olecranon and stylo-radial reflexes were normal, but the radiopronator and ulnopronator reflexes were abolished. This dissociation of reflexes in a single limb is analogous to the frequently noted dissociation of eye paralyzes, as well as of the dissociation of the signs suggesting pyramidal tract involvement. The skin reflexes were normal in all the patients. The defensive or spinal automatic reflexes were never very marked. In no patient was there observed the contralateral

flexion reflex to pinching of the femoral quadriceps—a reflex frequently positive in acute meningeal reactions. Even where all the tendon reflexes in the extremities were abolished, the nasopalpebral or trigeminofacial reflex, resulting in closure of the lids upon percussion at the root of the nose, was preserved. In two cases the reaction of the pupils to light was sluggish, but not abolished. In two patients all tendon and skin reflexes remained unaffected, and both patients recovered. The reflex disturbances as a whole betoken diffuse involvement of the neuraxis in lethargic encephalitis, the lesions being therefore not limited to the bulbo-pontopeduncular region. The frequency of manifestations of cerebral excitation with mental confusion indicates also a participation of the cortex in the morbid process. Early abolition of reflexes seems to be of prognostic import; the four patients showing diffuse loss of reflexes all succumbing to the disease, while the other two recovered.

Trismus in Lethargic Encephalitis.—Audry and J. Froment (*Presse médicale*, May 5, 1920) report two cases of lethargic encephalitis attended with trismus but no other form of contracture. The first patient was a pregnant woman who succumbed early with ophthalmoplegia, dysarthria, polypnea, and disturbances of deglutition. The second was a farmer who, after a blow on the head, developed headache, dysarthria, masklike face, and prostration. Tetanus might have been thought of, but the paralysis of accommodation, few myoclonic contractions, and moderate somnolence suggested rather an epidemic encephalitis, a conclusion subsequently confirmed by the marked success which followed administration of injections of hexamethylenamine. In both these cases, as in the case reported by Chermite and Saint-Martin, the distinctly predominant involvement of the midbrain leads to the conclusion that the trismus was due to irritation of the motor nucleus of the fifth pair, in the absence, however, of any sign of involvement of the sensory portions of these nerves.

Intracranial Complications in Aural Suppuration Coupled with Syphilis.—E. J. Moure (*Bulletin de l'Académie de médecine*, May 11, 1920) states that while in most cases of intracranial complication in acute suppurative otitis media the symptomatology is sufficiently suggestive to permit of a proper diagnosis, in some cases the functional disturbances presented are so indefinite as to mislead the physician. Some patients with ear suppuration develop pain on the affected side, with swelling and tenderness of the mastoid. In addition to these customary indications of mastoiditis the patient is a little more prostrated than usual, sometimes presents bilateral spontaneous nystagmus upon lateral vision, has more or less disturbances of equilibration, and even at times a beginning Kernig. In short, in addition to the mastoiditis there are presented the appearances of an indefinite intracranial complication. If there is acute otitis media, antrotomy is practised or if the case is one of long standing otorrhea, the radical mastoid operation is done from the start. The wound heals as usual and the bone lesions are

recovered from, but the headache, nystagmus, disturbed equilibration, and Kernig persist and often become even more marked. At a second operation cerebrum and cerebellum are explored in vain with the needle, merely yielding in some instances clear cerebrospinal fluid under pressure which, upon laboratory examination, affords no special indication or points simply to a meningeal reaction of varying intensity. Nor is this second operation followed by any improvement. In such cases Moure thought of the possibility of complicating syphilitic manifestations. The Wassermann reaction usually confirmed this suspicion, being negative only once, and all the patients recovered under systematic antisyphilitic treatment. One, however, succumbed to a subsequent recurrence; the autopsy showed a gumma of the cerebellum undergoing softening, whence an acute meningitis which killed the patient.

Influenza in the United States Army.—Howard and Love (*Military Surgeon*, May, 1920) from a study of the reports of influenza in the army give the following conclusions:

1. Influenza prevailed much more extensively in the army in 1917 and during the early months of 1918 than has been commonly recognized. There were 40,512 cases of this disease reported in the army for the year 1917.

2. Unrecognized influenza was probably the primary and underlying cause of many of the atypical and fatal pneumonic infections occurring in the army camps during 1917 and the early months of 1918, in addition to the cases known to have been associated with measles.

3. Influenza in 1917 and the early months of 1918 was relatively mild in type as compared with the virulent type of the disease which appeared in army camps in September, 1918.

4. The extension of the virulent influenza from Camp Devens to other camps south and west in September, 1918, can be traced in many instances directly to the interchange of military personnel from infected to noninfected camps. The contagion was transferred by persons either themselves infected or who were carriers of the disease, and the extension followed ordinary lines of travel.

5. The height of the September outbreak of the disease in the United States extended over a period of about nine weeks (September 13 to November 15, 1918). During this period over 20,000 deaths occurred among troops in the United States alone in excess of the number that would have occurred if the disease death rate for the corresponding period of the preceding year had prevailed.

6. The height of the epidemic in France extended over the same period of time as in the United States.

7. Influenza and pneumonia were less prevalent and less fatal among our troops in France than in the United States.

8. The cantonment group of stations gave a much higher death rate from influenza and its complication than other groups.

9. For the entire army (approximately 3,500,000 men) there were 688,869 admissions charged to influenza for the year, or twenty per cent. of the command. This record does not represent the full incidence of the disease during this period.

10. There were 47,384 deaths from all diseases for the year 1918, of which 23,007 were attributed to influenza. In addition, 16,364 were due to pneumonic infections, bronchitis and pleurisy, many of which, it is certain, should have been charged to influenza, making a total of 39,371 due to acute respiratory diseases, or eighty-two per cent. of the total deaths from disease for the year. Influenza with its complications is charged with 48.5 per cent. of total deaths from disease for the year.

11. Influenza was more prevalent among white troops than among colored.

12. White soldiers from the south had much higher admission and death rates for influenza, pneumonia and other acute respiratory diseases than white soldiers from other sections. The lowest rates for these diseases were among white soldiers from the Pacific Coast and Rocky Mountain States.

13. The negroes stationed in the United States had lower admission rates than the whites for the country at large.

14. The incidence rate for all forms of pneumonia was nearly three times as high for the colored as for the whites for the entire country.

15. The death rate for all pneumonic infections was more than twice as high for colored troops as for whites.

16. The case mortality for all pneumonia infections for the colored was about twenty per cent. lower than for the whites.

A Contribution to the Study of Cerebellar Localizations.—Alfred Gordon (*Journal of Nervous and Mental Disease*, March, 1920) reviews the literature on cerebellar localizations and four case histories supporting Bolk's localizations. The author finds from these four cases that the function of certain muscular groups is affected in diseases of the cerebellum. The selectivity of affection indicates that the cerebellum possesses distinct centres for the extremities and for the head and trunk. These primary centres are composed of secondary centres controlling segments of limbs as to their stability and orientation. Clinical findings show that the cerebellar centres for the upper and lower extremities are located in the hemispheres on the homolateral side. The head, neck, and trunk are under the influence of the vermis.

A Consideration of the Nature of Auræ.—L. B. Alford (*Archives of Neurology and Psychiatry*, February, 1920) has attempted to point out anew the analogy between auræ and the hallucinations occurring in connection with sleep, hypnosis, crystal gazing, etc. According to this view, auræ should be regarded not as the result of discharges of an epileptic nature in some part of the cortex, but as deficiency reactions, like dreams, occurring when there is a disturbance of consciousness of a certain type. Their relation to the loss or disturbance of consciousness in epilepsy and migraine is assumed to be the same as that of dreams to drowsy or sleep states, and their content should be regarded as being determined by the same factors that determine the content of dreams and similar hallucinations which develop in connection with disease of the organs of special sense or of the nerves connecting them with the brain.

Proceedings of National and Local Societies

MEDICAL SOCIETY OF THE STATE OF NEW YORK.

*One Hundred and Fourteenth Annual Meeting,
Held in New York, March 23 to 25, 1920.*

The President, Dr. CLAUDE C. LYTLE, of Geneva, in the
Chair.

(Continued from page 236)

SECTION IN SURGERY.

The Value of Position in the Operative Treatment of Hernia.—Dr. HENRY H. M. LYLE, of New York, with the aid of lantern slides, described the anatomical relationship of the abdominal and thigh muscles to Poupart's ligament and showed that when this ligament was relaxed the conjoined tendon would be relaxed. In operating for hernia he employed a simple procedure consisting of high ligation and transplantation of the cord, during which the patient was in the dorsal position. After putting in the first suture through the conjoined tendon, Gimbernat's ligament and out through the lower portion of Poupart's ligament, the patient's knees were propped up with the leg in internal rotation. The shoulders were also elevated. The hinged bed that had come into use during the war was useful in maintaining this relaxed position which was maintained for seven days and insured firm union.

Mesenteric Vascular Occlusion.—Dr. ROSS G. LOOP, of Elmira, said that this subject from the viewpoint of prognosis and treatment had received scant attention in our literature, and in the textbooks it was accorded little notice. In the French and German literature it had received much more complete discussion. Mesenteric vascular occlusion was not as rare a condition as was supposed and quite frequently it was mistaken for intestinal obstruction. He had seen seven proved cases within the last two years and was convinced that in the past he had failed to recognize many more. Its existence or nonexistence in obstruction cases spelled a bad or a good prognosis and influenced treatment. Mesenteric vascular occlusion presented two well defined forms. In the primary form the symptoms were not associated with other abdominal lesions. The process was one of thrombosis or embolism due to remote causes from the heart valves. Its practical interest lay in the fact that the surgeon might operate for the relief of intestinal obstruction, and at operation he had to deal with a self-reduced volvulus. If, on the other hand, a frank gangrene was found (a rare finding in early cases), he might resect the intestine without suspecting the cause of the condition. The second form occurred as a complication of various septic conditions and might be associated with the common forms of intestinal obstruction. As a complication of clean or aseptic surgery, it was responsible for many deaths that were attributed to postoperative ileus. The symptomatology in these cases was susceptible of another classification into fulminating and phlegmatic, both of which might be either primary or secondary. There might be considerable free fluid

in the abdominal cavity, ranging in color from a light yellowish to a dark brown. The blood vessels were cyanosed and dark. Gangrene might be present, or there might be mottled segments of intestine alternating with dark red ones. At times there might be small oval areas of necrosis. The peritoneum, except in areas where there might be local death, had not lost its glistening appearance. The involved coils were not distinct and lay inert and half filled with liquid, looking very much like a rubber glove with a little water in it. If handled the coils gave a peculiar sensation of weight and thickness. The mesentery was heavy and soggy, and thrombosed vessels might be seen if not obscured by tumefaction. One or two folds of the mesentery might hang down over the sacral promontory and give the impression of being adherent, but this was produced by the weight of the liquid contents. In all of his cases the middle third of the small intestine was involved and the mesentery appeared as a low attachment, and whether this had anything to do with the production of the condition he was unable to say. The fulminating cases presented a symptom complex which constituted a disease entity. The phlegmatic types were less easily recognized, especially if they were associated with preexisting trouble. The fulminating type was characterized by pain, sudden and violent, if primary, or if secondary by the same kind of pain in connection with the preexisting symptoms. The pain was worse on the left side. In the phlegmatic type the pain was not sudden or severe, but varied from a vague unrest to a severe cramp, and when this form was superimposed on another lesion it was insidious. Vomiting occurred in all the forms, was coincident with the pain, and tended to cease spontaneously in a few hours when the pressure above the lesion had been relieved by the vomiting. The muscle rigidity was not to be compared with that found in other equally severe conditions. The abdomen was not distended as in peritonitis. The condition was afebrile and the pulse soft and irregular. In the fulminating cases the patient was more or less in shock. Mesenteric vascular occlusion was a disease of adult life, more than seventy per cent. of the cases being in individuals over forty-five years of age. The condition might be mistaken for pancreatitis or rupture of a viscus. Moynihan stated that in this condition no surgeon could show a mortality of less than fifty per cent. The treatment was purely surgical, consisting of wide excision of the involved coils of intestinal anastomosis.

Special Points in the Surgery of the Gallbladder.—Dr. GEORGE W. CRILE, of Cleveland, Ohio, described the experience of his associates and himself in 1325 operations on the gallbladder and ducts from the viewpoint of the difficulties and failures that they had met with. Among the questions considered were how they might increase the certainty of relief, how they might decrease the risk from hemorrhage; what was the incision of choice,

and when the common duct should be drained. Hemorrhage might be met by transfusion. The best incision in operating on the common duct was parallel to the costal border; this did not divide many nerve fibres and secured against postoperative hernia. The incision should be long enough to insure adequate exposure. In cholecystostomy the best drainage was from the dependent point, and frequently this was obtained by a counter incision at the bottom of Morrison's pouch. In fulminating acute cases the only immediate procedure was to establish gallbladder drainage. It was very desirable to carry the acute gallbladder to the subacute stage before final operation. When this acute condition subsided and the patient's condition was stabilized, cholecystectomy was the procedure of choice in those cases giving a history of recurrent attacks of cholecystitis. In severe cases of acute cholecystitis he used a short incision, a round tube, plenty of gauze about the opening and no stitches.

The general principle of adequate exposure held for operations on the common duct as for those on the abdomen. In discussing cholecystectomy versus cholecystostomy, Doctor Crile said that in the absence of the gallbladder the common duct compensated by storing bile and this predisposed to the formation of stones and a recurrence of symptoms, so that the removal of the gallbladder was not without some unfavorable consequences. If the mucous membrane of the gallbladder was gangrenous, if the wall was thickened, or if stones were imbedded and after drainage there had been a recurrence of periodical attacks of cholecystitis with obstruction and infection, then cholecystectomy was indicated. If the gallbladder and cystic duct were normal, no matter what the size of the stone, there would rarely be a cycle of recurrent attacks and cholecystostomy would fulfill the requirements. In removing the gallbladder there should be free exposure through an ample incision so as to give free access to its base. The gallbladder should be dissected free by sharp dissection, without injury to the liver. The entire gallbladder should be freed from its attachments so that ample opportunity might be given for determining where it ended. The cystic duct should likewise be dissected free so that the exact point of division between the gallbladder and the cystic duct could be determined. The cystic duct should be taken off near the common duct. The clinical results following cholecystectomy were as much better than those following cholecystostomy as were those of nephrectomy better than those of nephrotomy. They were now doing about sixty cholecystectomies to forty cholecystostomies. In doing a cholecystectomy a careful dissection should be done so that the surgeon would not be at a disadvantage later if he were called upon to operate upon the common duct.

Liver shock was a common cause of death after gallbladder operations and was due to failure of the liver cells to perform their function. Its prevention was secured by the avoidance of liver cell depression. The depression of the liver cells was increased by trauma and by low blood pressure, and that meant suboxidation. To prevent this light gas anesthesia should be employed, the operation should

be as brief as was compatible with good surgery, blood transfusion should be given early, and heat should be applied over the whole abdomen.

Application of the Methods Developed during the War to the Fractures of Civil Life.—Dr. JOSEPH A. BLAKE, of New York, presented a lantern slide demonstration of the overhead suspension and traction treatment of fractures now being used in the treatment of fractures at Bellevue Hospital. At the beginning of the war they had treated fractures by the application of plaster of Paris, but they soon found that they would have to develop some method which would permit of better access to the wounds and which would be more susceptible of variation, so they came to use wire splints, and in 1917 and 1918 these were well established in the French and English armies. They were at first much hampered by the old opinions as to the treatment of fractures, namely, that these should be fixed as much as possible. However, the further they got away from the old idea of fixation the better were the results obtained. In fractures of the long bones it was easy to fix the distal fragment, but the difficulty came in fixing the upper or proximal fragment to the lower fragment.

The principles upon which the newer method was based was that when the proximal fragment was at physiological rest, it was in the position in which antagonistic muscles had brought it; it would not have much tendency to move in either direction, and if the upper fragment was in that position, the other fragment could be readily moved. Having placed the upper fragment in the position of physiological rest, the distal fragment was brought into line with it and then the whole extremity could be moved without moving the fracture. Doctor Blake then demonstrated the use of the overhead suspension frame in high fractures of the humerus. He said it gave uniformly good results, the only objection to it being that the patient had to remain in bed, and this was not an objection, considering the rapidity with which repair took place. He left the arm free during the day and put it back in the suspension apparatus at night, and in this way union was often obtained in eighteen or twenty days. In fractures of the forearm the fragments were not suspended in the same plane, one being suspended mesial to the other. In the application of traction they made use of the glued cotton glove with curtain rings sewed to each finger tip. This permitted of even traction, or traction might be applied to individual fingers. The Blake-Keller half ring thigh and leg splint was shown. This splint had proved of great value in the transportation of men with fractured femur, and with the Thomas arm splints should form a part of the equipment of every ambulance. He hoped that they would be able to extend some of these methods which had been so valuable in the treatment of fractures during the war to the treatment of industrial injuries of which there were at least three quarters of a million in this country every year. They shortened the period of convalescence and did away with at least five per cent. of the incapacity resulting from other methods.

(To be continued.)

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MEDICAL MEN IN THE AMERICAN REVOLUTION.*

The New York Campaign of 1776.

By LOUIS C. DUNCAN, M. D.,

Washington, D. C.,

Lieutenant Colonel, Medical Corps, U. S. Army.

The siege of Boston had ended in March with complete success for the Colonists, a success to be followed by a long succession of dismal failures before victory would again cheer their hearts. Boston had been captured with little loss in battle casualties, and, what is even more surprising, with even less from sickness in the camps. This happy event was also not to be repeated; henceforth the army was to be dogged by disease, the camps to be clogged with thousands of miserable sick. There men not only died by hundreds, but, scattering to their homes, carried disease and death to the inhabitants of every colony. But all this was in the web of the future, and the Continental Army, cheered by its recent easy victory, marched confidently on its way to where the enemy next threatened battle before the city of New York.

General Charles Lee had been despatched to New York in February, 1776. Raising a force of twelve hundred men in Connecticut, he marched into the city and assumed the principal authority there, in conjunction with three members of the Continental Congress. New York was threatened throughout the spring, but not actually attacked until July. Washington did not believe that the place could be held; there were so many points to be fortified and defended with his loosely organized and poorly supplied army that it seemed next to impossible to maintain all of them. He proposed to retire to the Highlands of the Hudson and defend the Colonies there; but the Congress decided that New York must be held, and he promised his "utmost exertions, under every disadvantage." When the British entered the river with men of war and threatened to cut off his forces, it was quickly proved to be a place that could not be defended in the face of command of the sea.

General Lee projected works on Long Island, at the Harlem, and at various points along the shores of the island. In February he was succeeded by Lord Stirling. When Boston was evacuated in

March, a large part of the Continental Army was moved to New York, and King's College was taken for a hospital on April 6th. Washington himself arrived on April 16th; going on to Philadelphia to visit the Congress in May, he left Putnam in command in New York, and Greene in charge of the works on Long Island. These generals held their respective commands until shortly before the Battle of Long Island. Washington found about eight thousand men in and about New York, poorly armed and equipped. On leaving Boston, five of the New England regiments had been left behind, and some had been sent to join the Northern Army, but the brigades of Heath, Sullivan, Spencer and one other had marched to New York. These brigades were of about five regiments each and may have numbered twelve to fifteen hundred men to a brigade. At New York the army was joined for the first time by regiments from the middle states.

The camps at New York were marked by much serious sickness, especially by typhus, which had scarcely been seen at Boston. There was also much dysentery, though this disease was seldom fatal. Dr. James Tilton said of the camps at this time:

The ignorance and irregularities of our men in the new scene of life subjected them to numberless diseases. The sick flow in a regular current to the hospitals; these are overcrowded so as to produce infection, and mortality ensues too affecting to be described.

Our Revolutionary Army exemplified this misfortune in a shocking manner. The Flying Camp of 1776 melted like snow in a field; dropped like rotten sheep on their straggling route home, where they communicated the camp infection to their friends and neighbors, of whom many died.

Rush said afterward:

It is very remarkable that while the American Army at Cambridge, in the year 1775, consisted only of New England men (whose habits and manners were the same), there was scarcely any sickness among them. It was not until the troops of the eastern, middle, and southern states met at New York and Ticonderoga, in 1776, that the typhus became universal, and spread with such mortality in the army of the United States.

Dr. Schoepff, chief medical officer of the Hessian force, which reached Staten Island in June, said that scarcely a man escaped sickness during that first summer. The principal disease was dysentery.

The officers of the army were not ignorant or entirely careless of sanitation, but the state of general knowledge and prevailing discipline made enforcement of orders difficult or impossible. On

*This article, which will appear in four instalments, is a chapter from a book to be published shortly.

July 28th the following order was issued from Headquarters of the camp on Long Island:

The General is pained to observe inattention to the digging and filling of vaults for the Regts &, the General directs camp colourmen (colored men?) of the several regiments to dig vaults and fill up the old ones every three days; and that fresh dirt be thrown in every day to the vaults; and that all filth in and about the camp be buried daily.

This order, if enforced, would have resulted in camps as sanitary as those of the Spanish-American War, one hundred and twenty-two years later. Unfortunately it was poorly enforced, as it was in 1898.

In February, General Lee, in a letter to Congress, suggested that a hospital be established in New York without loss of time. The work of building a hospital in New York (the second in America) had been commenced in 1771 and finished in 1774, to be burned down and rebuilt in 1775. But the necessity for barracks preceding that for a hospital, the unfinished hospital building, at the recommendation of the Committee of Safety, was occupied by the troops as quarters. It was afterward used by the British troops, but chiefly as barracks. Private homes were taken and (with King's College) formed the principal reliance for hospitals. They were safer, on account of the consequent separation of the sick, during the prevalence of dysentery and typhus. On April 3rd, while still in Boston, Medical Director Morgan received the following letter from the General:

As the Grand Continental Army . . . will, as soon as it is practicable, be assembled at New York, you are, with all convenient speed, to remove the general hospital to that city. As the sick in the different houses cannot be moved, but must be attended to until they are able to march, you will leave such surgeons, surgeons' mates, apothecaries, and attendants under the direction of (Surgeon to be selected by Dr. Morgan) as are necessary for the care of the sick now in the general hospital. The medicine, stores, bedding, etc., etc., not immediately wanted in the general hospital, should be loaded in carts, that will be provided next Saturday by the Asst. Q. M. General, and sent under the care of a proper officer, or officers of the hospital, to Norwich, Connecticut. Upon their arrival there they will find his Excellency's orders, and how and in what manner to proceed from thence, whether by land or water.

The medicines ordered upon his Excellency's application, by the honorable the General Court of this Province, to be taken out of the town of Boston, should be sent with the first of the hospital stores that go to Norwich, a careful person having order to take charge of the same.

The fixing and completing of the regimental chests, according to your plan, had better be deferred until your arrival at New York, when they may be set about under your inspection.

Before you leave Cambridge it will be necessary to see a proper regimental medicine chest provided and delivered to each of the surgeons of the four regiments left in garrison there under the immediate command of Major General Ward; also a chest for Colonel Glover's regiment, on command at Beverly.

Reposing entire confidence in your care, diligence and zeal for the service, I remain satisfied of your best exertions for the public benefit.

Given at Cambridge Headquarters, 3rd day of April, 1776.

GEORGE WASHINGTON.

To Dr. John Morgan.

This letter is quoted to show the interest taken by the General even in the details of the medical department of the army.

Dr. Morgan, in his *Vindication*, gives some information as to the sick left behind in the Boston hospitals, and also of the supplies that he had collected. They seem pitifully meagre now, but he evidently was proud of them. Many of these supplies had been abandoned by the British, on leaving Boston.

When the troops marched from Cambridge for New York, all the sick were left behind in the General Hospital, amounting to upwards of 300 men. In less than six weeks, during which time but few died, I was able to discharge the hospital of every man, to settle and pay every account, insomuch as never to have had any further demands from that quarter.

During this time, with little or no expense to the public, but for package and transportation, I collected medicines, furniture, and hospital stores, worth many thousand pounds, and sent them on to New York. The like quantity I apprehended could not be procured in any (other) part of America. Besides these, I was able by means of the subaltern officers in the hospital, some of whom I employed continually at this work, likewise to collect near to the amount of two thousand rugs and blankets, near as many bedsacks and pillows, which were taken up from docks, and were gathered from hospitals and barracks, etc., etc. These being washed and aired, served the last campaign, when none other could be got, and many of them are yet in good preservation (1777). In New York I collected some hundred sheets, fracture boxes, and other useful articles.

It may be thought that I place a higher value on these acquisitions than they merit; be that as it may, I am persuaded that the like could not be obtained for much less than thirty thousand dollars: which is equal to the whole amount of what I have drawn or expended, for the general hospital in the space of twelve months, including the pay of all the officers, and all the expenses of every kind; and for the faithful expenditure of the same I am ready to produce my accounts, receipts, and vouchers, whenever called upon for a settlement. Yet the general hospital has had the constant charge of a number from two to three hundred to a thousand sick and upwards to provide for.

Economy seems to have been one of Morgan's virtues, as it was Washington's. He did well to retain his vouchers, for long after the war ended he was wrestling with Congress over these very expenses. He went on to say:

I am persuaded that of the sick who have been drawn (rations) for in the general hospital, if none of them have been drawn for at the same time with the well men in their regiments, the stoppage of their rations will go a long way toward paying the whole of the expenses the hospital has been to on their accounts for provisions and stores of whatever kind.

Washington found time, in the month of June, probably, to inquire into the expenses of the general hospital. He learned from some unnamed persons what the expenses of a similar establishment should be in the British Army. Morgan says:

In a conference with the General, he (Washington) stated that the expenses of the general hospital should not exceed ten thousand pounds per annum, as some experienced persons had intimated.

Morgan feared it could not be done, but resolved to employ strict economy to keep it within those bounds. He mentions "the advanced price of every article of living and hospital stores," which it seems accompanied that war as well as later, and earlier, ones.

Wishing to know the basis of this estimate of the General's, he wrote to the person who made it, probably Dr. John Jones. He was informed that the estimate of ten thousand pounds was made for a force of ten thousand men, for six months. Mor-

gan estimated that the expense for the Army, on that basis, should be forty thousand pounds for one year—for twenty thousand men, the number then kept on foot. Morgan's administration was extremely economical, as will be better understood when the hundreds of thousands expended by his successors are considered.

At the same time he inquired of this person, who doubtless had been in the British service, to clear up all doubts as to the manner in which the regimental surgeons were supplied with instruments and medicines in that service. He seems to have been informed that such supplies were not drawn from the general hospital. He goes on to say:

The Congress, or your Excellency should give orders for a different mode to be pursued; I considered myself to be bound in duty to keep the British establishment constantly in my eye, as a directory, making allowances for the nature and differences of the service.

At another conference with Washington over difficulties, he, Washington, had said: "What is the practice in the British Army? Why should we think of improving upon their system, founded upon long experience?" It is clear that both the General and the Medical Directors were following the customs and regulations of the British Army, in so far as they could be applied to the Continental Army.

On June 3rd Congress called for thirteen thousand eight hundred militia from the New England Colonies, and ten thousand from Pennsylvania, Delaware and Maryland. These latter were to furnish what was designated as The Flying Camp, for the protection of the Jerseys, threatened with invasion by the British forces. General Hugh Mercer was given the command of this doubtful force, and Dr. William Shippen was made its Medical Director on July 15th. Shippen had been Morgan's colleague in founding the Medical College at Philadelphia, and was later to supplant, if not undermine, him. Mercer was a Scotch physician, a graduate of Aberdeen, who had followed Prince Charlie to Derby and escaped from the slaughter of Culloden. He had served in many Indian campaigns, where he was often wounded. He commanded a company in Braddock's dismal expedition, was severely wounded and left on that field of death, but escaped and made his way back through three hundred miles of wilderness. In 1756 he was both commanding officer and surgeon at McDowell's Fort in Pennsylvania, and was there twice wounded. In 1758 he was an officer under Forbes, fighting with the redcoats now. He entered the war as Colonel of the Third Virginia Line early in 1776. He was made a brigadier on June 5th and given command of the Flying Camp. He was to die by British bayonets, fighting to the last, before the year was out. Of the many heroes of the Revolution none merited that title more than did Dr. Hugh Mercer.

By July, Morgan had established his hospitals in New York, provided them with stores, and was as he supposed fairly well prepared for the coming storm. But as to the regimental surgeons he was in dismay. They had next to nothing, and, most of all, seemed careless or ignorant of their own helpless state. He says:

I am well off in the general hospital, except in a few particulars. I have provided ten thousand bandages, have

some hundred old sheets, and a stock of medicine (though unassorted). I have of capital instruments nearly enough for hospital use. But in the meantime what is to become of the regimental surgeon? Should I divide my stores among them, they would be dissipated and ourselves left destitute. To observe a medium I have orders to be issued from the general hospital stores, sixty bandages, two sheets, four tourniquets, a quantity of lint and tow, and a chest of medicines. . . . But of instruments I have none to spare, and I begin to want some capital medicines. Moreover, symptoms of a putrid fever begin to appear. [Typhus.]

At this time there were about forty regiments with the Army. The hospitals in New York then were: King's College, City Hospital, City Barracks, and whole streets of houses appropriated by the convention of New York. Country seats at a distance of some miles were also taken. King's College was the principal hospital, the others were subsidiary. General Greene complained of the neglect of the sick on Long Island. Dr. John Warren (1), of Boston, was made surgeon of that part of the General Hospital, established on Long Island for the troops there. Dr. Isaac Foster was his assistant. Morgan's letter of instructions (2) to Warren is full and comprehensive.

The hospitals about New York were an improvement on those hitherto established, yet left much to be desired. Especially were the regimental surgeons lacking; not only in tents and bedding, but also in instruments and dressings, of which they had next to none. Morgan inquired into these shortcomings and took what he considered the proper steps for remedying them. While most of his proposed measures were excellent, in one principal one he appears to have failed to hit upon a proper remedy. The regimental surgeons were always short of supplies and were continually applying for them to the general hospital. He always maintained that he had none to spare, which was true. But, instead of proposing a general supply officer, under his own jurisdiction, he proposed a system of continental druggists, located some place and under no control. This was the point on which he failed. He himself admitted afterward that this was the rock on which he foundered, but never admitted that he was in error. His letters and papers at this period, though not always clearly composed, give a complete picture of the difficulties of the general hospital at that time.

In a letter to Congress, in July, 1776, he stated his own case. Morgan may be allowed to tell his own story of his efforts to supply the regimental surgeons and put them on a proper working basis. He says:

A powerful fleet and army from Great Britain intended for the reduction of New York, being likewise already arrived on the coast; and having prepared everything in my department that was in my power, I then considered the unsettled state of the regimental surgeons. In order to bring them by degrees into greater regularity, and to make them more useful in case of action (as many of them had newly entered the service and most of them from want of experience were yet novices in the duties of a military surgeon), I thought it advisable to give them some instruction which might open their minds to a sense of what their duty required of them, as regimental surgeons, in time of action, which it could not be supposed was very distinct. I therefore drew up the following directions and communicated them to the General. He approved of them in the orders of the day; and commanded

the several surgeons of the regiments to wait upon me for copies, and to regulate themselves according to the proposed plan. Each surgeon was allowed a copy, and commonly, at the same time, I gave him an order on the apothecary of the general hospital for a medicine chest, for every battalion: which he also obtained if he was not already provided: together with a number of tourniquets, and a quantity of lint, tow, and old linen for surgical dressings.

The order and instructions are worth repeating here in full:

Order and Instructions Given to the Regimental Surgeons in Case of Action.

NEW YORK, July 3, 1776.

It is proposed by the director general, and ordered by his Excellency, the Commander in Chief, that the regimental surgeons and mates may be the better prepared for the discharge of their duty, in case of action, to hold themselves in immediate and constant readiness for service; and, in the first place, to make a return to the director general of the hospital, of those names and stations, and of the instruments and bandages, etc., they have on hand, agreeable to the following form:

A regimental return of surgeon's instruments and bandages, etc., now in readiness for medical service; belonging to Colonel Regiment, in Brigadier General Brigade, encamped at July 3, 1776.

Name.	Instruments on hand for use.	Number and kind of bandages, ligatures, etc.	Old linen and other implements.
Surgeon	Amputating instruments	Simple rollers	Quantity of linen or weight of rags
	Trepanning instruments	Foliated bandages	Weight or quantity of lint
Mate	Incision knives	Splints	Tow or sponges
	Pocket instruments	Tourniquets	
	Bullet forceps	Ligatures	
	Crooked needles	Tape	
	Straight needles,	Thread	
	Pins		Signature

As the general hospital will not admit of the hospital surgeons and mates being divided or detached, and may require occasional assistance from the regimental surgeon, in case of many wounded being sent to it, the following regulations are to be observed for the present, and till any change of circumstances may require an alteration.

Part of the general hospital is now fixed at Long Island, for the reception of sick and wounded persons, whose cases may require it; which John Warren, Esq., Surgeon in the General Hospital, is appointed to superintend and direct, with the assistance of three hospital surgeons and mates, and such other regimental surgeons and mates, belonging to that part of the army stationed at Long Island, as may be required. In case of evident necessity, arising from an attempt being made on Fort Defiance (afterwards called Fort Washington), two of the hospital mates with Dr. McHenry, now at Montrossor Island, and whom he is to superintend and direct, are to repair to that post, with a proper assortment of medicines and bandages.

The remainder of the surgeons and mates of the general hospital are to continue at King's College and New York Hospital, for the reception of such wounded as are sent to them, from whatever part.

It being the duty of the regimental surgeon and mates, in case of action in the field, to attend the corps to which they belong, in order to dress the wounded in battle; they are to take post in rear of the troops engaged in action, at the distance of three, four or five hundred yards, behind some convenient hill, if at hand, there to dress the wounded who require to be dressed, on or near the field of battle.

If the regiment or corps to which they belong are engaged within a fort, or lines thrown up for defense, that fort or place of defense is then the proper station for the regimental surgeons. But as a regiment may be divided, and distributed into different posts, so as to render it impracticable for the regimental surgeon and mate belonging to that regiment to be near some part of their corps, it is necessary that an account of the number of surgeons and mates in any brigade or any division of the army that occupies one or more detached posts be taken, and delivered to the commanding officer of said posts or divisions. It is

to be considered as the duty of each regimental surgeon and mate respectively, wherever stationed, to regard himself as having a joint charge of the whole brigade, with the rest of the surgeons of that brigade, rather than as if his care was to be confined only to those officers and soldiers who are of the regiment to which he belongs. It must unavoidably happen, at times, that both officers and soldiers may be wounded in action, and their particular surgeons be elsewhere employed, so as not to be able to attend them.

The amputation of a limb, or performance of any capital operation, cannot well take place in the heat of a brisk action. It is seldom possible or requisite. What the surgeon has chiefly to attend to, in cases of persons being much wounded in the field of battle, is to stop any flow of blood, either by tourniquet, ligature, lint and compress, or a suitable bandage, as the case may require; to remove any extraneous body from the wound; to reduce fractured bones; to apply proper dressings to wounds; take care on the one hand not to bind up the parts too tightly, so as to injure the blood circulation, increase inflammation, and excite a fever; or, so loosely as to endanger the wounds bleeding afresh, or to allow broken bones, after they are properly set, to be again displaced. The wounded being thus dressed by the regimental surgeons, are next to be removed to the nearest hospital belonging to the brigade, or to the general hospital, as may be most convenient.

As the general hospital may at times be fully crowded with sick persons, or in the time of action, so many wounded may be sent there, as to require a greater number of hands than that part of the general hospital, where many of the wounded are sent, is furnished with, it may be absolutely necessary for the superintending surgeon, besides the proportion allowed him from the general hospital, to call for the assistance of a number of surgeons and mates from the brigade, division, or post of the army where he is, either before an engagement, or, when the number of wounded persons sent to him becomes very great, making such assistance needful. For this purpose he is to apply to the commander of the brigade, or any part of the army, who is hereby ordered to send him as many regimental surgeons and mates, for that purpose, as are required and can be spared from their posts.

To prevent confusion, and that the regimental surgeons may know the better what part of duty is expected from them, some one, at least, of the surgeons, especially those fixed at outposts, are directed, as soon as possible, to call upon and arrange matters, in time, with the hospital surgeons nearest at hand, in behalf of the brigade, or corps acting together, that no disorder may arise, in time of action, for want of so necessary a precaution. The regimental surgeons ought to call on the officers of the corps to which they belong, to settle with them, what persons are to be employed in carrying off the wounded, and for a supply of wheelbarrows, or more convenient biers, for conveying them from the field of battle to the place appointed for reception of the wounded, or general hospital. Each regimental surgeon and mate ought to have a portable box, with suitable divisions for containing his lint, bandages, instruments, and other implements of surgery, which ought to be well provided with every necessary.

In applying a common tourniquet to stop the flow of blood from any principal artery in a limb, till it can be otherwise properly secured, care must be taken not to twist it too tightly above the limb; and to prevent the tourniquet from slipping, so as to endanger a fresh loss of blood, it must be fortified with a ligature of thread or tape.

JOHN MORGAN,
Director General.

This circular of instruction, though in places most clumsily worded, contains much useful information and directions. The direction as to placing the dressing station behind a convenient hill is naïve. The reminder that a surgeon should not confine his attention to his own organization, but should attend any man in need of help, his own proper surgeon being absent, was very necessary. The fear of too tight a tourniquet causes him to refer to it twice. The mention of wheelbarrows and biers for

the wounded makes it apparent that no real standard litters were then in use. The Dr. McHenry mentioned was he for whom Ft. McHenry at Baltimore was afterward named.

He attempts to overcome the difficulty of requiring regimental surgeons to assist at the general hospital, which they then, as now, did not desire to do, but the scheme is involved and lacking in force. Throughout the circular there is much mingling of what will be done and what ought to be done. Yet, on the whole, this circular shows that Dr. Morgan had a clear conception of the situation and what should be done; that he was attempting, under the greatest difficulties and inertia, to get these things done. He states, later, what success or lack of success he had in his endeavors. His statements list the complete surgical armamentarium of the regimental surgeons of the Continental Army at that time. It was meagre beyond imagination. There were then about forty small regiments in the Army at New York. They averaged little more than 300 men each.

In consequence of the foregoing plan and orders, some reports were made, although they came in but slowly. Near a fortnight passed over before I received them from more than fifteen regimental surgeons. It is to be ascribed, if not to that backwardness which the regimental surgeons ever showed to complying with general orders; perhaps to a conscious shame of being entirely destitute of any necessary articles, but what they had previously indulged to draw from the general hospital: Some of them, whom I afterwards met, and inquired into the cause of their neglect, confessed this to be the truth.

As my intention in desiring these reports to be made to me, was to lay them before the General and Congress, with remarks on their insufficiency, that the medical committee might be incited to use more diligence, than heretofore, to fall on some measures for supplying the regimental surgeons with every necessary to qualify them for greater usefulness in their station. I drew up, from the separate reports delivered to me, one general return of the state of the above mentioned fifteen regiments. All the instruments were reputed to be private property, and amounted to:

- Six sets of amputating instruments.
- Two sets of trepanning instruments.
- Fifteen cases of pocket instruments.
- Twenty-five crooked and six straight needles.

Among the whole fifteen surgeons there were only four scalpels or incision knives, for dilating wounds, or any other purpose; three pairs of forceps for extracting bullets; half a paper and seventy pins and but few bandages, ligatures, or tourniquets; and as little old linen, lint or tow, but what they had procured from the general hospital; and only two ounces of sponges in all. Amazing deficiency for fifteen surgeons and as many mates!

Upon inquiry how they could think of marching with their regiments, without at least providing old linen for dressings; or of joining the army without the necessary instruments, as, if ever they reflected at all they must be sensible of the impropriety of so doing, and of its being much easier for each man to procure those articles, within the sphere of his acquaintance, connexions, or neighborhood, than to obtain them in an army, in general destitute of necessary supplies, of what was not to be procured in America, but with great difficulty: Their constant answer was, whenever they applied to their superior officers for those things, they were always told, they would be furnished with everything they wanted, as soon as they should have joined the army. Upon being informed that I had only a sufficiency of those things for the general hospital, and that I would by no means unfurnish it to supply them, they appeared quite confounded, and expressed great uneasiness, at having no proper establishment; and said, they knew not how, or where to obtain the necessary articles, to be anyways useful in the army, if I did not assist them.

As I was not ignorant of the many inconveniences under which they had hitherto labored, from a want of attention in the Congress to relieve or place them on a better footing, and as I felt for their distress, I assured them of my readiness to assist them, all in my power, confidently with my proper duty, and the orders I had, or should receive from Congress. I asked them to meet in a body; to converse on the matter with each other; and then to choose one or more deputies from each brigade, to state their helpless situation, and pray for relief; in which I was willing to second their application, with all the influence of which I was master.

As they complained much of not being allowed proper regimental hospitals, and as I had, in opposition to what appeared to me to be the sentiments of both the Congress and the General, ever uniformly given it as my opinion, that regimental surgeons and regimental hospitals, under proper regulations, and due subordination to the general hospital, might be very useful. I took that matter under my consideration. I likewise drew up a memorial, and proposals, to be shown to the General, for his approbation and concurrence, to be laid before Congress. At the same time I penned for the use of the regimental surgeons, a form and directions for keeping a proper register of the sick, and for making every kind of necessary returns of sick, provisions, etc., etc., also tables of the various kinds of diet used in the general hospital, as are examples for themselves to copy after; under the heads of: full diet, half diet, low diet, milk diet, and fever diet; with the method of calculating the difference betwixt these, and the amount of the well rations; to enable them to draw the value of the difference, whether in cash or refreshments, but for the use of the sick only: And I showed them a list of what instruments, bandages, ligatures, lint, tow, old linen, and other articles I esteemed necessary for a Regiment; which I shall subjoin to the substance of the memorial and petition to Congress, and the proposals I had sketched out for their consideration (3).

At an appointed meeting with the regimental surgeons, before producing the papers referred to, the director addressed them in a prepared speech, which he had the forethought to preserve (3).

(To be continued)

HISTORICAL NOTES ON THE PRACTICE OF MEDICINE IN NEW YORK CITY.

BY G. L. ROHDENBURG, M. D.,
New York.

It has recently been my good fortune to be permitted to search the Whitehead Library of the Lincoln Hospital and Home of New York for items of historical interest in medicine. This library was founded by Dr. Whitehead, and consists not only of his own library but also the libraries of Dr. Livingstone, one of the founders of the long defunct Queen's Medical School, and of Dr. Sabine, who was for many years a member of the faculty of the College of Physicians and Surgeons, New York. Many of the volumes, particularly the older ones, are importations from England, and are either the works of English authorities now more or less forgotten, or translations from some other European language. A fair number are early American works dating from 1778 to 1804. In a survey of these volumes I have gleaned a number of somewhat disconnected items which are perhaps of more than passing interest at the present time.

Among the things of interest which have been found are a series of facts having to do with the early history of medicine in the City of New York. During the supremacy of the Dutch West Indian Company in New Amsterdam, the names of Johan-

nes Megapolensis and of his son Samuel appear as the prominent physicians of the period. A little later the names of Johannes La Montague, also a prominent physician, and of Abraham Staes and Hans Kierstede, both of much repute as surgeons, are found in the records. The last named had a daughter, Tryn Jansen, who was a famous midwife. At a still later period, Gerardus Beekman is mentioned.

The first postmortem occurring in the city was performed on the body of Governor Slaughter, who died under suspicious circumstances in 1691; and it is recorded that the physicians performing it were paid eight pounds six shillings for their investigation. The first anatomical dissection was performed by John Bard and Peter Middleton in 1750; and the first medical school was founded in 1767 by the group consisting of Samuel Bard, Middleton, Clossy, Smith, Tennant, and Jones. Middleton was selected as the first professor of pathology and physiology in

physicians displayed great discretion by remaining within doors.

In 1807 the College of Physicians and Surgeons was founded; and in 1814 this institution united with the Medical School of Columbia College. The equipment of the institution was exceptionally poor, for it is recorded that in 1814 the three students used umbrellas in the lecture halls on rainy days. The course in anatomy consisted of the dissection of one body a year.

The deficiencies in education were to some extent corrected by the formation of medical societies for the exchange of views on medical matters and for the development of sociability; thus the Physico Medical Society was founded in August, 1815, and in 1823 the New York Kappa Lambda Society of Hippocrates was started.

The New York Pathological Society was founded in June, 1844, the first meeting taking place in the



PENNSYLVANIA HOSPITAL, 1820

the medical school of King's College, which in 1784, after the Revolution, became Columbia College. The first medical degrees were granted in 1769, when Samuel Kissam and Robert Tucker were made Bachelors of Medicine.

The medical school having been founded, the troubles of the faculty began in their inability to obtain anatomical material, for which reason the students and faculty acted as their own resurrectionists. Even Valentine Mott confessed to his share in such proceedings. This resurrectionist habit led to the famous Doctors' Riot, which occurred on April 13, 1788, lasted two days, and cost ten lives, troops being called out to repress the disturbance. Numerous prominent individuals were injured, among them Baron Steuben of Revolutionary fame. The inciting cause of the disturbance was the incautious exposure of a pair of freshly varnished and dissected legs hung out of the college window to dry. Dr. Cocks states that for the period of the disturbance the

office of Dr. Lewis Sayre at the corner of Broadway and Spring Street, but a short distance from the old quarters of the Queen's Medical School at Duane and Hudson Streets. The College of Physicians and Surgeons, which subsequently became the meeting place of the society, was at that time located on Crosby Street. Dr. Sayre had the doubtful honor of disposing of specimens after the meetings by throwing them into the Hudson River. At one time he was almost caught by the police, and at the next meeting his confrères urged him to be more circumspect—this not in the tenth century, but in 1847.

Even in those days civic pride, which is now typified by a statue atop of the Municipal Building, was a fully developed and vigorous movement. Some of the inaugural addresses before the Academy of Medicine, which was founded in 1847, are almost tauntingly boastful of the achievements of the medical men of New York City.

Dr. McGrath, the first hydrotherapeutist in th

city, has been immortalized by Smollett. Vaccination against smallpox was first introduced into the city by Dr. Seeman, and inmates of city institutions were first vaccinated by Dr. Beekman Van Buren. The New York Hospital, first located on Bedloe's



RUDOLF VIRCHOW

Island, was founded in 1771 and incorporated in 1790. James Stringham was the first professor of legal medicine, and Governor Eddy of New York authorized the establishment of the first insane hospital in the United States.

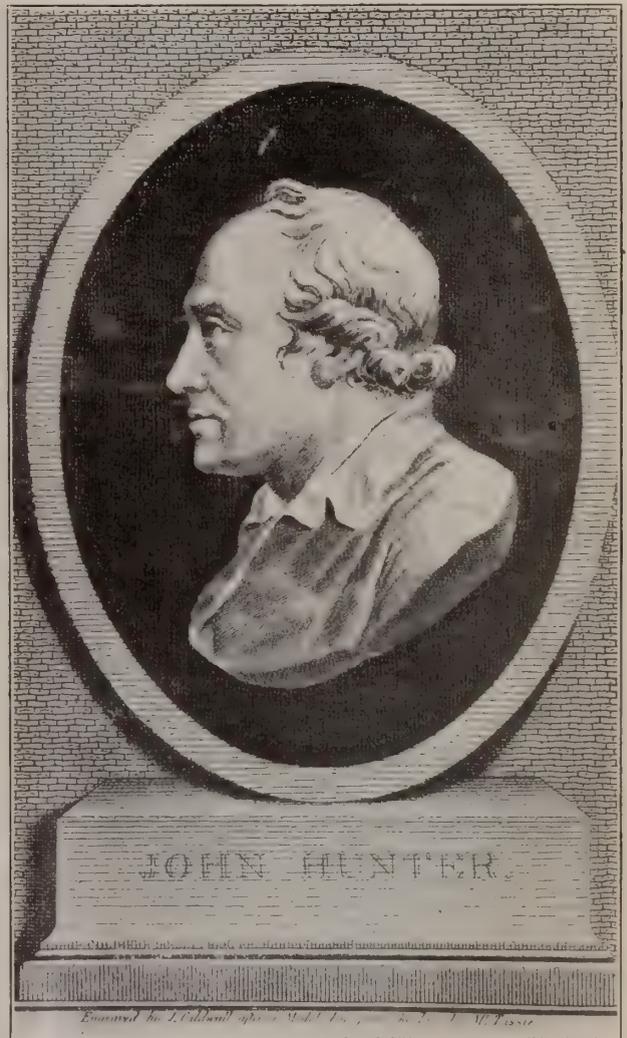
Among other causes for civic pride, as having been first performed by residents of the city, were the following operations: Ligature of the arteria innominata, ligature of the left subclavian artery within the scaleni, division of the esophagus for the relief of impermeable stricture, extirpation of the upper and lower jaw, excision of the elbow joint, and scarification of the interior of the larynx. To us of the present day these may not seem to be wonderful; but in those days aseptic surgery was not dreamed of, and antiseptic surgery had not yet been born; even anesthesia was but in its very infancy. In fact, Dr. Valentine Mott was so impressed by the fact that he had seen, in 1818, a case of compound fracture of the femur in which recovery had actually occurred that he thought it worth while to report it in detail.

There are before the profession today problems which had their counterpart in the older days under different names, and since history is but the experience of bygone generations, the terse and forcible

Anglo-Saxon in which they described their troubles may also interest us. In 1849, the three most prominent patent medicine dealers in the city were an insolvent drygoods store keeper, a clerk in a lamp store, and a bookbinder. In denouncing these parasites, Dr. Francis remarked:

"In a few instances the powers of quack medicine have been so highly esteemed, that large sums of money have been given to the owners to reveal their secret composition; but as soon as the mystery has been unraveled the charm has disappeared, and the remedy which was once regarded as so important has been consigned to oblivion, the common grave of quacks. The remedies which are now so much esteemed on account of their working powers, will undergo the same fate, and other Swains, and Morrisons, and Grandfathers, will appear in other days to reap an income from the credulity of the ages in which they shall live, and like those who have gone before them will in their turn be forgotten."

In the early years of the last century the question



of cults and isms was also a crying problem. The chief of the new fads at that time was homeopathy, and from a scathing arraignment of the entire fad the following quaint doggerel is copied. It was quoted as being a typical application of the principle

of infinitesimal dosage carried to the point of *reductio ad absurdum*.

Take a little rum, the less you take the better.
Pour it in the Lakes of Wenner and of Wetter.
Dip a spoonful out, mind you don't get groggy;
Pour it in the Lake of Winnepissigogge.
Stir the mixture well, lest it prove inferior;
Then put half a drop into Lake Superior.
Every other day take a drop in water.
You'll be better soon, or at least you ought to.

In a discussion of the necessity for higher education preliminary to the study of medicine, Alexander Stevens put his finger upon an extremely sore spot, one in existence even today. "The defect of American character, as regards scientific requirements, is overweening selfconfidence, or an undervaluing the necessity of technical knowledge for the successful pursuit of the learned professions, and consequently a lamentable deficiency or superficiality in their acquirement."

Dr. Francis in the same year commented rather acidulously upon the action of the State Legislature in letting down the requirements for the right to practise medicine: "Nothing but the poverty of language debars me from a suitable expression of opinion of that calamitous proceeding of our State Legislature which has broken down the door of the temple for all who please to enter and administer."

The ethics of newspaper publicity also aroused a considerable storm in the early meetings of the New York Academy of Medicine, Isaac Wood in a vigorous discussion drawing the attention of the members to the fact that, "so far as they have been made,

opposition to established principles, for it is rare that time does not prove them to have been without foundation; especially do not be misled by reports of wonderful cures or the efficacy of new operations." Well might the opening phrase of the sentence be emblazoned upon the editorial page of every newspaper in America.

The more jovial aspects of the profession are exemplified by the accompanying cartoon drawn by

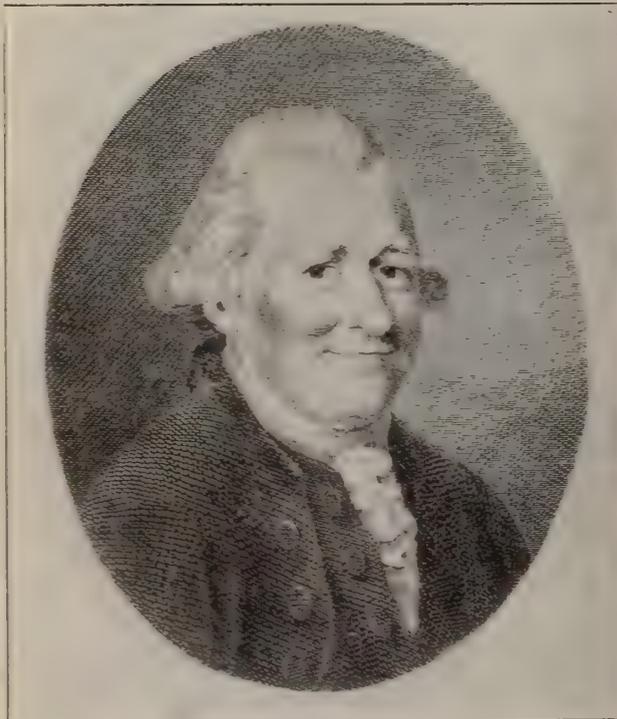


Cartoon depicting a quiz in the office of Dr. Willard Parker.

Dr. Sabine and depicting a quiz in the office of Dr. Willard Parker. Prohibition was not then in vogue, though Dr. Valentine Mott publicly protested against the rum ration of medical students as too large, a half pint *per diem* being allowed. Whether the large pot in the foreground is a receptacle for tobacco cuds or, as might be deduced from the title of the cartoon, a precaution against gastric upheaval, the artist leaves to our imagination. The other illustrations of the present article are presented because of the excellent work of the engraver. One is of John Hunter, best known to the younger generation because of his association with the recognition of chancre. Another is of John Brown. A third is a hitherto unpublished photograph of Virchow, the founder of cellular pathology; while the fourth will be readily recognized by the inhabitants of the City of Brotherly Love.

From a scientific viewpoint the old volumes record the alert mentalities and acute powers of observation of bygone generations. To those who passed through the influenza epidemic of 1918 it may be of interest to know that almost one hundred years ago Graves described a similar epidemic in Ireland. His description of the gross pathology fits the condition so exactly that with the addition of the label: "From the laboratory of the XYZ Hospital," it might have been written but yesterday. The bronchiolitis, the absence of complicating empyemas, the intense congestion, the persistent cough, the following incidence of tubercle, the alopecia, are all wonderfully clearly described, as Graves says, for the benefit of posterity, so that eventually the cause of the disease may be discovered. He states that such epidemics have been known for over 200 years, and points out the differences between influenza and bubonic plague.

Another item of interest is the preface to the



JOHN BROWN

the reports of our proceedings in the public prints have not advantaged us either collectively or individually." Alexander Stevens at the same time warned the newspaper reporters that they should "be cautious in giving credence to alleged facts which are in

first English edition of Koch's *The Infectious Traumatic Fevers*. Cheyne, who wrote the preface to the translation, betrays his origin by his conservatism, for one sentence reads as follows: "The reader of the following work cannot fail to admit the beauty and importance of the observations which it records provided he can be satisfied of their authenticity." Thus was the demonstration of the cause and mechanism of sepsis greeted upon its translation into the English language.

The opinion of the older American surgeons upon the surgery of cancer is well represented by Alexander Stevens, who in a report of cases of fungus hæmatodes of the eye (melanosarcoma) appearing in the *Medical and Surgical Register* of the New York Hospital for 1818, mournfully concludes:

"From these gloomy details not one ray of consolation can be derived. The occurrence of disease in parts distant from the primary affection (metastasis) in the last two cases is too remarkable to pass without notice. It naturally tends to the conclusion that the disease is not local, and offers a strong inducement to the surgeon to limit his views to the smoothing of the avenues to the grave from which he can neither free nor respite his unhappy patient."

905 WEST END AVENUE.

DENTAL INFECTION.

By SINCLAIR TOUSEY, A. M., M. D.,
New York.

Dental infection is no new thing. Benjamin Rush over a hundred years ago cured cases of rheumatism by ordering the extraction of infected teeth. It is now known that infection may exist for years without local symptoms, pain, or swelling. Probably in many cases the infected teeth could have been found by the dentist before the days of the x ray, but now this examination shows the condition in many cases as clearly as it shows a fracture of the bones of the leg.

A dead and putrified nerve or tooth pulp is full of germs from which poison is absorbed into the system. This may go on for years, since the pulp chamber in the tooth cannot collapse like the walls of any ordinary boil or abscess and the lesion undergo spontaneous cure. The amount of absorption from an abscess at the apex of the root of a tooth is not indicated by the small size of the abscess cavity but by the rapidity with which the poison is generated and the freedom with which it is communicated to the blood. The free bleeding which ordinarily ensues when a tooth is extracted illustrates the anatomical fact that the tooth is not like an inanimate glass plug in the tooth socket but is a vital organ with blood vessels which must be torn in order to extract it. Through this free blood supply the poison from a blind abscess is poured into the system at a speed of which we can obtain some idea from the other class of dental infection, pyorrhea. In the latter case we may be able to press a large drop of pus from the pocket surrounding the root of a tooth every five minutes.

Two kinds of poison are absorbed; the germs themselves and toxins or their poisonous products.

The germs enter the blood but there they are ordinarily destroyed by certain white blood cells called phagocytes, and even in many cases of serious or fatal disease unmistakably due to dental infection, the germs do not grow and multiply in the blood and may not be discoverable in it. This is true in regard to certain other germ diseases. For instance, in a case of tuberculosis we look in the sputum, not in the blood, for the tubercle bacilli. When the normal resistance of the blood to invasion by the germs from a focus of infection has been lost or greatly reduced, then the germs may multiply in the blood and usually with a fatal result. A pint of blood drawn from the body, cooled and therefore devitalized, may be experimentally infected with the pus from an extracted abscessed tooth and if kept at a temperature of about 100° F. will in a few days become a mass of living and multiplying germs sufficient if divided up in hypodermic doses to kill a company of one hundred soldiers.

In many cases where the germs never succeed in growing and multiplying in the blood, some of them are carried by the blood and lymph to places where they form a secondary focus of infection. A clot or vegetation may form in the heart valves, full of the living and multiplying germs. This occurrence is commonly the beginning of a lingering and painful death. Fragments of the infected vegetations break away and are carried by the blood, and blocking up small arteries cause paralysis, pneumonia, and a host of other complications affecting every organ and function of the body. This painful and hopeless illness often lasts many months and all that time there is a possibility of sudden death from blocking of a large artery in the brain.

Happily a dental abscess almost always produces symptoms due to absorption of poisons before any direct germ extension takes place. These symptoms are as manifold as the different organs to which the blood carries the poison. Two persons seldom are affected in exactly the same way. Some of the subjects have high blood pressure with a tendency to result in arteriosclerosis and finally apoplexy and death. Others have one or other of the different lesions and symptoms called rheumatism. Others have neuritis, neuralgia, and various eye troubles which formerly seemed to be due to rheumatism, one eye even having been saved by the treatment of a tooth abscess discovered too late to save the other. Indigestion is a common effect. And there is a general agreement with the Mayos that ulcer and cancer of the stomach and cancer of the gallbladder are usually due to dental infection. Skin diseases and insanity are in many cases due to dental infection. A complete list of conditions which may be caused by dental infection would be a very long one.

We often hear it said that this is a temporary fad, like removing the tonsils for rheumatism. And again the physician who recognizes the possibility and even the strong probability that the patient's symptoms indicate the presence of dental infection too often is asked, "You want me to have all my teeth out?" It is true that many cases of rheumatism and other diseases are due to infected tonsils. That was not a temporary fad but is today the

means of restoring health and saving lives. We know that the teeth also are a source of infection and we know that a focus of infection may sometimes be found in the sinuses and that sometimes autointoxication may develop from primary intestinal conditions.

These facts do not make it a fad to examine the



FIG. 1.—Radiograph of jaw of skeleton showing mental foramen.

tonsils or the teeth or the sinuses or the intestines and to cure any focus of infection that is discovered. Particularly in regard to the teeth, the x ray enables one to acquit the healthy teeth and it certainly would be a fad to go ahead and blindly extract all the teeth, good and bad, in a case of rheumatism.

That the different diseases and symptoms referred to are often caused by a focus of infection and that many of them if taken in time are cured by the eradication of the focus of infection is not the theory of one person or of any group of persons. It has been tested and proved by many physicians, surgeons, and dentists in many different countries. The tests as to causation have been similar to those establishing the fact that typhoid fever is caused by typhoid bacilli and cholera by the cholera bacillus.

A great variety of symptoms are known to have dental infection as their frequent, common or even usual cause. These symptoms may not be serious in themselves and if they are due to dental infection that cause may be left undiscovered and untreated for years. Delay in the discovery of the

dental infection may occur because the idea had not occurred to the physician, or the patient may delay the x ray examination because of a fear that one or more teeth may have to be extracted. This delay cannot possibly enable the infected tooth or teeth to become normal. It simply results in their getting worse and, whereas at an early stage the dentist is often able to treat and cure and preserve an infected tooth, an advanced stage may be reached where only extraction is possible. The sooner an infected tooth is discovered and cured the greater is the hope that others may not become infected.

The idea used to be that an old snag of a root ought to be preserved at all hazards to prevent absorption of the alveolar process and falling in of the cheek. This is a dangerous theory and in actual practice many a patient has been poisoned by pus from an infected retained root. And the x ray has often demonstrated extension of pyorrhea from such a root as the cause of destruction of the alveolar process of a neighboring tooth. A perfectly good tooth may be sacrificed by clinging to a dangerous and useless root.

The lower bicuspid apices are close to the mental foramen, an opening in the lower jaw through which a nerve passes to the chin and lower lip. A radiograph (Figs. 1 and 2) of the lower jaw of a skeleton shows this opening in an unmistakable way, but the foramen has no such characteristic appearance in a radiograph of a living person. Indeed it often looks very much like a periapical abscess of the second lower bicuspid and has doubtless been frequently mistaken for one. It is only necessary to be on one's guard against this error and in case of doubt to make a radiograph of the second lower bicuspid on the other side of the face. An identical appearance of the right and left lower second bicuspids would be the strongest indication that the appearance was a normal one due to the mental foramen.

It has long been known to the author that a vital tooth may show periapical infection and he has made a radiographic diagnosis of periapical infection in teeth which were vital, some with and some without pain. A lower molar pulp may die in one root canal and be alive in the other and in the pulp chamber. As a rule if the radiographic appearance is doubtful it is recommended that the vitality of the tooth be tested by heat or cold or by faradism. And if found to be vital the tooth is given the benefit of the doubt. Where, however, the x ray appearance is unmistakable, even though the tooth may respond to heat and cold and faradism and be exquisitely sensitive when drilled into, then the interests of the patient require that the nerve be killed or the tooth extracted. The latter would be called for if the radiograph showed such a bending of the root that disinfection of the root canal and of the periapical abscess cavity would be impossible. With pain and swelling, in fact with the ordinary symptoms of a dying nerve, the dentist has never been at a loss as to the proper treatment. But without the x ray it is not always possible to determine promptly which tooth is affected and I have walked the floor twelve nights while a tooth four spaces from the affected one was being treated.

It was a case of the shoemaker's children going barefoot, and the moment a radiograph was made the error was discovered. And even in the right tooth the x ray will sometimes be required to trace the root canal and the way into the abscess cavity. Guided by the radiograph the dentist presses his drill in the right direction, it enters the abscess and pus wells into the pulp chamber.

It is the cases of a vital pulp without pain or swelling but with unmistakable x ray evidence of periapical abscess that are the most difficult for the dentist to decide about and he may very probably ask to have another corroborative radiograph made before reaching a decision.

An important discovery has just been announced by Hartzell and Henrici to the effect that pathogenic germs are often found in the vital pulps of the teeth affected by pyorrhea or having carious cavities. Their experiments were conducted in such a way as apparently to prevent artificial infection of the pulp, and in twenty-six healthy teeth extracted and opened in the same way the pulps were all found aseptic. This agrees with my own observation of many vital teeth with periapical infection.

From some cause the radiograph of a dead tooth which has been treated and filled may show the root canal only partly filled. This appearance may be due to the use of a transparent filling material or to the filling being actually incomplete. In the latter case a space remains permanently which is exceedingly prone to infection. And when there are symptoms of infection it is often necessary for the dentist to treat the root canal and fill it completely.

Many authorities favor the extraction of every dead tooth, but there are many others who believe that a dead tooth can often be sterilized and be kept in that condition for many years and for all that be a harmless and useful member. A dead tooth is of course always under suspicion and to be kept under occasional x ray observation. At the first indication of its being infected treatment through the root canal should be instituted and if it becomes infected time after time for a period of years, the rule seems to be that what can't be cured must be extracted. Of course many a time the radiograph reveals such an extent of necrotic bone, or the symptoms of systemic poisoning are so severe that one's effort should be not to save the tooth but to save the patient.

The condition in which the tooth is found after extraction is an important subject for consideration. The tooth itself may in some cases appear normal or close scrutiny may show a small area at the foramen where the natural smooth surface is lacking. We know that an infected root canal and an infected periapical space causing systemic infection do not necessarily involve any marked change in the gross appearance of the extracted tooth. The dentist and the patient should not for a moment suppose that the tooth was harmless or even a desirable possession because it looks practically normal after removal. We can tell from the radiograph before extraction whether the root has been denuded or eroded, and if so, to what extent. And changes in the tooth itself are not the decisive

factor in deciding that a focus of infection exists which if not capable of cure by treatment through the root canal requires extraction.

The fang of a rattlesnake or the needle of a hypodermic syringe may be perfectly smooth and still convey an active poison. The putrescent pulp of a tooth may poison the system through the apical foramen without any necessary change in the gross appearance of the root.

We sometimes hear that some dentist has told a patient that a blind dental abscess will sometimes exist for years without causing illness. The inference is intended to be drawn that if you have symptoms or lesions which all dental, medical, and surgical authorities state are often caused by dental infection, it is just as well not to have an x ray examination and when one is made and shows the existence of a blind abscess the inference these people suggest is that it may just as well be left untreated and uncured.

I do not believe that at the present time any dentist would make the statement unqualifiedly or would draw these conclusions from it. But years ago this was the case and the following history shows the natural result of such beliefs.

CASE I.—Dr. S. was referred to me for the treatment of neuritis of the shoulder and forearm by



FIG. 2.—Radiograph of lower jaw of skeleton showing mental foramen.

high frequency currents applied from ultraviolet ray vacuum electrodes. At the same time he was under treatment elsewhere for high blood pressure, by x ray flashes, a method in which I fail to see any special virtue, as compared with a continuous application of the rays. He also complained of

severe headache. Systemic infection from dental foci without local symptoms had not then been discovered. I had made thousands of dental radiographs in cases presenting local indications and it occurred to me to make radiographs of all the teeth to see if the headache was a reflex from an infected tooth. The radiograph showed extensive destruc-



FIG. 3.—Radiograph showing gouty tophus of the hand of a patient with pyorrhea.

tion of bone about the apices of several upper teeth. That report and the radiographs were taken by the patient to two different dentists who examined the teeth by their usual methods and pronounced them all right. The doctor did not want to hurt my feelings by telling me their report and the teeth remained untreated until two years later when he was in a serious condition at Battle Creek. Then the affected teeth were extracted and there was some improvement, but the proper treatment had been applied too late to prevent death by apoplexy at the age of fifty-six.

Another fatal case occurred just at the transition period in our knowledge of dental infection.

CASE II.—The patient, Mrs. T., complained of a lame lower first bicuspid tooth, and a radiograph showed an area of rarefaction diagnosed by the author as periapical infection. The dentist, however, thought the tooth was not infected but simply irritated by impact with the corresponding upper tooth. His treatment was not to open the tooth and make applications through the root canal but to grind the two opposing teeth. A year later a frank abscess developed causing great pain and some swelling and recurrences during a long course of treatment. Later rheumatic symptoms ensued and septic endocarditis with infarctions in the spleen, kidneys, lungs, pleura and brain. This illness lasted seven months with pain, convulsions, paralysis and complications affecting the eye, ear and nearly every other organ. All the twenty-five general and special physicians and dentists who saw her as occasion arose attributed the illness and death to dental infection.

The natural way now is for an x ray examination to be made upon the occurrence of the first

local or constitutional symptoms and for radical treatment to be applied to any dental infection revealed. I do not believe that a person is often well for years with a blind abscess of a tooth. I have known many persons who were up and about with a variety of painful if not disabling symptoms who all this time had a dental focus of infection and who got well after the latter had been discovered and treated. To my mind, this indicates not the harmlessness of such a focus but that very often the system is able to resist the infection long enough for the symptoms to be recognized and proper methods of diagnosis and treatment to be applied.

When a dentist or a physician says that the dental infection idea is often overdone, I have sometimes found on inquiry that he refers to a case in which he knows all the teeth of say a thirty-six year old woman to have been extracted. He naturally thinks that many of these were probably not infected and might better have been preserved. And that is exactly the reason for an x ray examination. The strongest reason to suspect dental infection does not afford an indication for extracting all the teeth but for locating the infected ones and acquitting the harmless and useful teeth. Another dentist may refer to the fact that the radiographer has told the patient that if the abscesses revealed had been left undiscovered and untreated some of the serious symptoms or lesions described above would probably have ensued. The dentist thinks his patient has been unduly alarmed, and it really would have been the part of wisdom, as long as the examination had been made and the trouble and its remedy discovered, to omit the list of the dangers that had been averted.

A patient, who is a great grandmother but is very active bodily and mentally, has practically all her natural teeth but has a discharging abscess of an upper bicuspid. Her dentist referred her for an x ray examination of all her teeth and many chronic infections were shown with the bone so extensively involved that several teeth could not apparently be restored to a healthy condition. Only the lower front teeth could be given a clean bill of health. On asking the patient herself whether this had affected her general health she said not at all. And



FIG. 4.—Radiograph showing marked pyorrheal destruction about one of the lower incisors.

yet she had had two strokes of paralysis, still has paralysis of the trigeminal nerve, has a bad knee for which the author applied high frequency current by vacuum electrode several years ago, and has some asthmatic trouble. Such a case and the numerous cases of arthritis or myositis causing torture or disability for years from untreated

dental infection, show how slow it is to produce death by its own poison. The more terrible cases alluded to were rapidly fatal from secondary lesions which are always to be feared. But just as the rattlesnake always gives warning, these fatal complications of dental infection are practically always preceded by signs which he who runs may read. But unlike the rattlesnake, the warning is not empty noise but some real injury, though the latter is fortunately temporary as a rule if the warning is heeded.

These patients could not be said to be well for years in spite of dental infection, the truth is manifestly that they have been ill for years. And it is my belief that if the dentist knew all about the patient, few patients with dental infection would be considered well for years.

CASE III.—An illustrative case is that of a lady about sixty years old who came a couple of years ago for dental radiography because of constitutional symptoms. A space was seen at the apex of a dead and treated tooth occupied either by pus or by a granuloma. The dentist was especially skillful and experienced in the subject of dental infection and his judgment was to leave the tooth alone as long as it did not make the patient sick. This advice was taken and for two years the patient was able to be about and to enjoy life, which was the basis for the supposition that the tooth was not causing illness. All this time, however, the indigestion continued and there was a gradual increase in the high blood pressure and the sense of fullness in the brain and the pain in the knee (with a negative radiographic appearance) and especially a gouty swelling and redness and pain in the nose. An extended series of inoculations with extracts of every conceivable article of food and drink showed no reaction to indicate that any of these caused the symptoms. Then a radiograph showed the affected tooth to be in the same condition as two years previously. It could not be cured by treatment and the dentist extracted it. A sac was adherent to the root. The symptoms including the high blood pressure were all improved immediately and the final result was that the blood pressure became normal and remained so, and the other symptoms all disappeared.

The burden of proof should not be thrown upon the patient to prove that he is actually sick and more especially to prove that his sickness is due to the infected tooth. Such a course gives the infected tooth too great an opportunity to do irrevocable harm. The burden of proof that the tooth is actually infected should not be thrown upon the patient who is manifestly ill and has a manifest periapical cavity, which might look very much the same whether it contained pus or an infected or uninfected granuloma, or who has a dead tooth from which the nerve has not been removed in whole or in part or the root of which has been only partially filled leaving a space prone to infection.

Whenever it is a question between saving the tooth and saving the patient, the latter must have the benefit of any doubt. In many cases both the patient and the tooth can be saved by the treatment of the latter. But if conditions are such that the

tooth cannot be treated and it manifestly may be a focus of infection and the patient has symptoms well known to be often due to dental infection, the patient and not the tooth should have the benefit of any doubt.

In a case of disease, say rheumatism, an x ray examination of the teeth is made not chiefly to find out the cause of the disease and a possible or probable cure; but far more to find out whether there is tooth infection which may well be a much more important matter than the symptom or lesion which has suggested its possible presence. Supposing there is an infected tooth in a case of arthritis, how are we going to prove that it is the cause? Supposing there are tubercle bacilli in a patient's sputum or diphtheria bacilli in a culture from a patient's throat, how are we going to prove that the germs are the cause of the patient's illness? Observations and experiments by the world's greatest scientists, with every hospital and laboratory facility and extending over years, were required to prove that these germs are the cause of these two diseases. To prove it in an individual case might well be impossible and even the attempt would certainly subject the patient to experiments, and delays and dangers. The usual custom is to proceed with measures of treatment and prevention of contagion just as if Koch or Klebs and Loeffler had made the actual demonstration of the causative relation in our particular patient.

There are cases where the secondary lesion is of so serious or permanent a character that no radical improvement seems to be expected from the discovery and cure of the primary cause. Even here an infected tooth is not a benefit to the patient, and is a very probable cause of still more painful and serious lesions and of nonsuccess of remedial measures.

Dental infection sometimes shows how severe it has been by the reaction which ensues where the tooth is extracted or the abscess opened into through the root canal. This is a reason for not initiating treatment of more than one or two foci at once.

When the dental infection is the cause of the symptoms or lesions an immediate cure is not always to be expected. A condition of the system which has lasted for years may not instantly respond to the removal of the cause, though the ultimate result may be perfect. In fact, if there is instant benefit the patient had better be warned that this may be temporary and that lasting benefit may come gradually.

Pyorrhoea.—This is practically always known to the patient and the dentist. In England it is considered to be the most common cause of arthritis. No x ray examination is required to detect its presence. It is only necessary to realize that it can cause the same troubles as a blind abscess and that the primary infection is controllable by treatment in most cases and immediately cured by extraction in the most advanced cases. Fig. 3 shows a large gouty tophus on a man's hand and Fig. 4 marked pyorrhoeal destruction about one of his lower incisor teeth.

Even without any belief in the causative relation and regarding it merely as a coincidence that

dental abscesses and other dental infections are frequently found on x ray examination in cases of arthritis and a good many other diseases, no one but a Christian Scientist would for a moment doubt the desirability of discovering and curing a dental infection.

Coming now to Christian Scientists, the author has explained to them that whether from an error or from a physical cause over which the mind has no control, carious cavities develop in teeth which only the dentist's tool can clean out and which only filling with suitable physical substance can protect from further decay and infection. When germs have passed through the exposed canaliculi or pores of the tooth substance like water through a filter, they often cause putrefaction of the dead nerve just as germs cause putrefaction of dead animal or vegetable substances entirely outside the human body. In the latter case we know that toxins or poisonous substances are produced which will injure or kill animals absorbing them, and when we see twenty-three persons out of a cooking class of twenty-seven die after eating from the same supply of canned string beans containing, as subsequent analysis disclosed, the *Bacillus botulinus*, we cannot avoid the conclusion that it was a grave error for them to eat the infected vegetable matter. Whatever the best treatment for the resulting poison common prudence would prompt the scientist, no less than the nonbeliever, to sterilize the home made canned beans by the physical agency of boiling before eating them and so avoid the poisoning.

A putrescent tooth pulp has been shown by animal experiment to contain germs and toxins which will cause in animals the various lesions and symptoms which occur in human beings with dental infection. The putrescent tooth pulp is in a cavity with hard walls which can neither collapse and so obliterate nor produce granulation or cure itself by any other natural process whether under influence of the mind or not. Like dislocation of the shoulder it is a physical condition which, with our present knowledge, cannot be cured without the use of physical agents. Whatever may be the treatment of a burn, common prudence would suggest to the scientist no less than to the unbeliever the un wisdom of cleaning gloves with gasoline near an open fire. Common prudence would indicate the un wisdom of allowing to remain undiscovered and unremoved a physical cause for trouble. No matter what one's belief might be he would not leave on the surface of the body a quantity of acid or caustic alkali accidentally spattered there but would promptly wash it off. He would remove the physical cause of trouble as soon as possible, regardless of his belief and regardless of the treatment to be adopted for the resulting burn.

I am not a Christian Scientist and do not believe they are able to help every sufferer, and it is my belief that this is one of the cases where the aid of physical agents is required. The fact of our present dependence in some cases upon physical agents is illustrated by the case of air, water and food, without which life itself ceases.

850 SEVENTH AVENUE.

THE RELATIONSHIP OF THE ANEMIAS TO LIFE INSURANCE*

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The general mortality in this country, according to the Mortality Statistics of the Department of Commerce for 1916, was approximately 1,400 for every 100,000 population. In these statistics no attempt has been made to differentiate the various types of anemia. Under the headings anemia and chlorosis are combined evidently the many types of primary and secondary anemia, with the exception of leucemia which is considered separately. Two of every 100,000 persons are reported to have died of leucemia. The death rate in 100,000 for the various forms of anemia was 5.3. Peptic ulcer is reported to have caused death in 4.6 in 100,000 persons and biliary calculi in 3.4 in 100,000. It appears then that with respect to mortality the various forms of anemia, leucemia and diseases of the spleen (7.5 in 100,000) are equal in importance to ulcer and biliary calculi combined (8 in 100,000).

One death in 700 deaths is attributed to leucemia. This disease is less common in rural districts than in cities; for instance, in Massachusetts, in cities of more than 10,000 population the rate is 2.3 in 100,000, in the rural districts 1.2. There seems to be little variation throughout the United States; the rate for Kentucky, however, is low (1.1 in 100,000 in cities and 1.2 in the rural districts). With such a definite difference the question of diagnosis in this state naturally arises. The total number of deaths attributed to leucemia in the registration area of the United States was 1424, of which males predominated (males 876; females 548). There seems to be a gradual increase in the number of deaths attributed to leucemia up to the ages between fifty and fifty-four. There is not a great variation, however, in the death rates during any period between the ages of forty-five and sixty-four. At all ages approximately twice as many cases in males as in females are reported. Leucemia seems to be a rare disease among the colored race.

One death in approximately three hundred deaths is attributed to some form of severe anemia. Throughout the registration area for 1916, 3785 deaths were attributed to anemia, the number in females exceeding that in males; females 2,101; males, 1,684. The number of deaths attributable to the anemias shows a marked variation in different portions of the country. In general, there is less anemia in the rural districts. Massachusetts has approximately equal distribution (6.8 in 100,000 in cities and 6.9 in rural districts). Kentucky again shows a wide difference, especially among the colored race (for the colored race 12.6 in cities and 2.8 in rural districts; for the white race 6.1 in cities and 2.0 in rural districts.) The average for the United States is 5.3 in 100,000. The question of diagnosis is so involved with respect to the anemias that very few deductions can be drawn from these statistics.

* Presented before the Medical Section of the American Life Convention, March 11, 1920, French Lick, Indiana.

In the medicoactuarial mortality investigation I have found no report on pernicious anemia alone. From 0.3 to 0.8 per cent. of the total number of deaths, with variation according to the age of entry, are attributed to anemia and chlorosis. For applicants between the ages of fifteen and twenty-nine, 0.3 per cent. of the total number of deaths are attributed to some form of anemia; for applicants between the ages of thirty and forty-four 0.8 per cent.; and for applicants at the age of forty-five or more, 0.7 per cent.

I have not been able to find in the literature a discussion of the relationship of diseases of the blood and spleen to life insurance. The question has been regarded evidently of little importance for two reasons: First, the total number of deaths from any one disease of the group is small, with the exception of pernicious anemia, and second, the insurance companies have not accepted applicants who were anemic or who were reported to have a large spleen or to have been splenectomized. This is, of course, a very safe attitude from the viewpoint of the insurance company, but is likely to be unjust from the viewpoint of the individual applicant. Much inconvenience, worry, and a definite financial loss are occasionally due to rejection for life insurance. I believe that the medical departments of life insurance companies should give a very full consideration to the applicants who may be rejected in order that they do not receive false impressions of their condition.

It is possible to state definitely that several types of anemias are curable: 1, Secondary anemias, which are due to hemorrhage, in which the cause of hemorrhage is benign and can be eliminated entirely; 2, secondary types of anemia which are dietetic in origin or due to hysterical dysphagia; 3, splenic anemias in which an exploration at the time of operation shows no evidence of cirrhosis of the liver, portal or splenic thrombosis, or gallbladder disease, and for which a splenectomy results in satisfactory convalescence; and 4, anemias which are associated with the clinical entity, hemolytic jaundice, after the patient has satisfactorily recovered from splenectomy.

Pernicious anemia.—J. W. Fisher, of the Northwestern Mutual Life Insurance Company, has furnished me with information concerning claims paid in cases of death due to pernicious anemia. In 1919, thirty-six of a total of 4,234 deaths from all causes were from pernicious anemia; this is .85 per cent. None of the thirty-six patients had been listed on the books less than three years, and the average duration of their insurance was nineteen and six tenths years. Of a total of 18,878 deaths from all causes in persons insured by this company during the last five years, 191 were ascribed to pernicious anemia, approximately 1 per cent.

F. H. Rockwell, of the Equitable Life Assurance Society, found in reviewing his statistical material that 172 of 27,784 deaths, from May 1, 1917, to Jan. 31, 1920, were due to pernicious anemia. This is a percentage of 0.6. The policies of these persons had been in force less than five years in only 5.2 per cent.

N. W. Muhlberg, of the Union Central Life Insurance Company, has furnished me with the statistics of this company. For the five-year period 1915 to 1919 there were 7,474 deaths, of which seventy-three were attributed to pernicious anemia, a percentage of .97.

The statistics of the Northwestern National Life Insurance Company furnished by H. W. Cook for the years 1915 to 1919 show seventeen deaths of 1,589 from pernicious anemia, a percentage of 1.06.

The statistics of these insurance companies may be compared with the general mortality statistics of one death in three hundred ascribed to anemias. The statistics of the insurance companies show approximately three times as many deaths from pernicious anemia as those of the Department of Commerce. This may be explained by the fact that the cause of death in insured persons is always carefully investigated by the companies, while many deaths from pernicious anemia are undoubtedly listed under other conditions in the general mortality statistics. It is likely that the actual death rate from pernicious anemia is about one for each one hundred deaths rather than one for each three hundred deaths.

Dr. Fisher states that his company does not issue insurance to persons suffering from anemia in any form and consequently special examinations of the blood are not required. Evidently insurance companies in general assume this attitude with respect to applicants with severe anemia, and so far as pernicious anemia is concerned it is very proper. Of all patients with a severe grade of anemia the smaller proportion are those suffering from pernicious anemia. Applicants with severe anemia undoubtedly should not be accepted for life insurance. It seems no more than just, however, to reconsider their applications for insurance after a period of four years. The average life of persons with pernicious anemia is less than two and one half years; occasionally patients have been reported to have lived for longer periods; a few for twelve years and longer are on record. An examination of the blood smear in the laboratory of the medical director would be a protection to the insurance company. The smears, in cases of pernicious anemia, show many large red cells which stain rather deeply, as well as deformed cells and cells with polychromatophilic degeneration. These characteristic findings, especially if associated with normoblasts or megaloblasts, would be sufficient evidence for the rejection of the applicant. Patients with secondary types of anemia, which are in many instances entirely recoverable, present a blood smear showing rather small, pale red cells without the presence of abnormal marrow cells. Two features occur almost constantly in the history of patients with pernicious anemia; recurrent attacks of glossitis with the gradual development of a shiny glistening tongue, devoid of papillæ, and the complaint of numbness, tingling, and other paresthesias in the hands and feet. These neurological complaints are the result of the cord changes which are present to a certain degree in eighty-five per cent. of the cases. Applicants with blood smears characteristic of the secondary types of anemia could be advised to seek

diagnosis and treatment by a competent clinician, and to reapply for insurance in from two to four years.

Leucemia.—In the Northwestern Mutual Life Insurance Company five of 4,234 deaths from all causes in 1919 were attributed to leucemia, approximately 0.1 per cent. During a five year period among 18,878 deaths from all causes 0.2 per cent. were due to leucemia. In the year 1919 there was only one death from leucemia during the members' first year of insurance, and this seems to have been a case of acute leucemia with an illness of very short duration. The five applicants who died had been insured in the company on an average of ten and six tenths years.

A review of the statistics of the Equitable Life Assurance Society shows eighty-four out of 27,784 deaths to be due to leucemia, a percentage of 0.3; of the Union Central Life Insurance Company, ten of 7,474 deaths, a percentage of 0.13. L. F. Mackenzie, of the Prudential Insurance Company, has furnished me with statistics on industrial insurance from which I calculate a percentage of 0.12 for deaths due to leucemia.

It is evident from these statistics that in a company with a well organized medical department leucemia is a disease which demands little special attention. It is conceivable that a patient with leucemia might occasionally be accepted by mistake as a life insurance risk. I have seen at least half a dozen cases in which the patients were not anemic and the diagnosis was made as the result of a blood count taken because of the presence of spleens which were barely palpable and might easily have been overlooked. The patients themselves came with complaints of a neurotic nature. There is no means of excluding this group of mistakes, however, without very careful clinical study, but in such cases the blood smear would disclose definite evidence of the disease.

Secondary types of anemia.—I would like to draw your attention especially to the types of secondary anemia from which patients may definitely recover and because of which it would apparently be an injustice to deny an applicant the privilege of obtaining insurance at some later date. We have been surprised to find that very severe anemias may result from slight and at times almost unrecognizable bleeding from hemorrhoids which may have lasted for two or three years without evidence of anemia. Finally, however, the hemopoietic organs fail to respond to the demand placed on them; and under these circumstances a very slight hemorrhage is sufficient to maintain a severe grade of anemia. In fact, the organism may be said to develop the "anemia habit," so that at the time the patient is examined a marked anemia may be present without hemorrhage. Patients who have developed the so-called anemia habit usually require one transfusion, after which the blood improves with medical treatment. Proper operative measures for the hemorrhoids obviate the possibility of further bleeding and the patient is permanently cured.

Secondary types of anemia due to profuse menstruation over a period of years are similarly re-

coverable. The increase in the number of policies issued to women makes this a noteworthy consideration. It is not necessary that uterine bleeding should be excessive to result eventually in a severe grade of anemia. If anemia is due to a hypertrophic endometritis, it can usually be checked permanently by means of radium. Removal of a benign polyp is also frequently necessary. An improvement in the condition of the blood will occur and within one year or, at the most, two years a reapplication for insurance should be acceptable.

Applicants with severe anemia due to obscure bleeding from ulcer of the duodenum should have the same consideration that is given to applicants with duodenal ulcer when an operative cure has been effected.

Dietetic anemias of adults have not received the attention they deserve. An improperly balanced diet, especially one low in protein or green vegetables, may result in severe secondary anemia. In addition to these simple forms of dietetic anemia H. S. Plummer has demonstrated a new clinical syndrome, of which the cardinal clinical features are anemia, very slight enlargement of the spleen, and a hysterical block of the upper end of the esophagus. Patients with this condition frequently choke on pills and certain kinds of food, especially meat. They consequently avoid foods which cannot be finely divided. After the passage of an olive, regardless of its size, they are able to eat normally. Following this the anemia promptly improves, the spleen becomes normal in size, and the patient completely recovers.

Applicants for insurance who may be shown to have severe secondary types of anemia due to such conditions as hemorrhage from hemorrhoids, profuse menstruation, and hysterical dysphagia should, it seems to me, be allowed the privilege of reapplication two or three years later when a sufficient length of time has elapsed to permit recovery in favorable cases.

The medical examiner must constantly be on guard in order that he may not overlook the simple anemia of such serious diseases as tuberculosis, nephritis, and cancer. It is very well known that even moderately severe grades of anemia may be difficult of recognition on inspection alone. In fact the use of the Tallquist scale should be required in the examination of every applicant. Special mention should be made of the severe degree of anemia which sometimes occurs in association with carcinoma of the fundus of the stomach, and also of the colon, especially of the cecum and ascending colon. Indeed the diagnosis of cancer of the colon in these cases may be reached with extreme difficulty.

Splenic anemia.—Applicants who have had splenic anemia should be considered for acceptance when all other conditions that may simulate splenic anemia have been excluded, if cirrhosis of the liver and portal or splenic thrombosis were not demonstrated at the time of splenectomy, provided that recovery has been prompt and the person has been well for a period of four or five years. Splenomegaly in simple splenic anemia occurs with a pure-

ly secondary type of anemia which in many instances is associated with, and probably the result of, gastro-intestinal hemorrhages caused by the engorgement of splenogastric vessels. Patients with uncomplicated splenic anemia who survive operation are cured. In our series of seventy-one cases of splenic anemia in which splenectomy was performed, thirty-two were found to be uncomplicated cases; portal cirrhosis and ascites were not present, the exploration of the gallbladder was negative, and there was no evidence of splenic thrombosis. In thirty of the thirty-two uncomplicated cases the patients recovered following operation, and all, so far as can be ascertained, are well.

Hemolytic jaundice.—The cure of hemolytic jaundice by splenectomy is one of the conspicuous therapeutic triumphs in diseases of the hemopoietic system. Hemolytic jaundice is a rare disease with distinctive clinical characteristics. Elliott and Kanaavel in their very careful review of the literature (1915) collected forty-seven cases (one case of their own) in which splenectomy had been done. In 1917 I reviewed the cases of seventeen patients splenectomized at the Mayo Clinic. Since then fifteen more patients have been examined, making a total of seventy-nine. The actual incidence of the disease is difficult to determine. We have observed approximately fifty cases (medical and surgical) in five years, or ten cases each year among fifty thousand or more patients. This incidence, therefore, is about one in five thousand patients. The results following splenectomy were uniformly good; recovery was prompt and permanent. In every instance in which the diagnosis of hemolytic jaundice was indisputable the patient was cured if he survived the operation.

There is, however, one exception to this general rule: A patient who has had hemolytic jaundice for many years may develop anemia in which the blood picture of pernicious anemia is simulated, at least a blood count of high color index (1+). In this type of case the anemia may persist to a certain degree after splenectomy.

The first splenectomy for hemolytic jaundice was performed by Spencer Wells in 1887; Dawson, in 1914, twenty-seven years later, reported this patient to be cured. Bland-Sutton operated on a patient in 1895. Ten years later this patient was well. Banti, in 1903, operated on a patient who was reported cured eight years later. The first patient operated on at the Mayo Clinic is now in excellent health, nine years after the operation. The clinic's experience in a series of thirty-two splenectomies for hemolytic jaundice has demonstrated remarkable results. There is no doubt in the minds of surgeons and physicians in general who observe the remarkable improvement in the condition of patients who have been splenectomized for hemolytic jaundice, that some very important factor is either neutralized, removed, or so influenced that a cure results. It is impossible at present to determine life expectancy for applicants for life insurance who have had splenectomy for hemolytic jaundice. However, they may at least be entitled to consideration for term insurance at a special rate, and indeed could be safely granted a more liberal form of policy.

SUMMARY.

1. The increase in the incidence of pernicious anemia makes it advisable to consider this disease separately in mortality statistics, rather than to include it among anemias in general.

2. Medical examiners should be required to report a hemoglobin estimation of each applicant (the use of a simple scale would be sufficient). Blood smears forwarded to the laboratory of the central offices by examining physicians would be of great assistance in eliminating for insurance applicants with pernicious anemia and leucemia.

3. The refusal of all applicants with anemia without a definite understanding concerning the possibility of later reapplication and acceptance may be a serious injustice to the individual.

4. Applicants with anemia from chronic recurrent hemorrhage, anemia from insufficiencies of diet, or as a result of functional dysphagia, may be expected to recover within one year at most after proper treatment, and should be given the privilege of reapplication at a subsequent time.

5. Applicants who have had splenectomy for splenic anemia, provided cirrhosis of the liver, gallbladder disease, and thrombosis of splenic vessels are not present, might be considered acceptable risks for term insurance after having been well for five years following operation.

6. Applicants who have recovered following splenectomy for hemolytic jaundice may safely be considered for a more liberal form of policy if they have remained well for five years.

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Râles after Expiration and Cough as a Means to Early Diagnosis in Tuberculosis.—B. L. Taliaferro (*Virginia Medical Monthly*, January, 1920) has the patient breathe out, cough, and quickly breathe in. Râles not heard on ordinary or deep breathing are often thus elicited. Where the patient is unable to carry out what is required of him, the author demonstrates the procedure himself. The patient is told to cover the mouth with a gauze handkerchief, imagine that it is a window pane on a cold morning, blow the breath out as fast as possible, next give a quick hack or cough into the gauze, immediately take a fairly deep breath, and repeat the process each time the examiner moves the stethoscope.

CLINICAL SIGNIFICANCE OF CARDIAC MURMURS.*

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The English school has been and is still the leader in the study of cardiac diseases. Since the days of Walsh and Corrigan down to the present time, with such men as MacKenzie and Lewis, there has been a gradual evolution and change regarding the value of the presence of a murmur in studying heart disease. In presenting this paper I shall not attempt to review the literature nor add anything specially new. The object of the paper is to present the subject matter in such a way as to be of benefit to both the specialist and the general practitioner. As a teacher of physical diagnosis in the hospital wards, in the amphitheatre and in the out clinic for more than twenty years I have reached some definite conclusions. Perhaps some of them may seem radical.

The question naturally arises, especially where the clinician has had a broad experience in observing diseases of the heart, when is a murmur of value in making a diagnosis? When is it significant and when is it to be dismissed in making a diagnostic estimate? In my consultation work I have been much impressed with the fact that entirely too much value has been attached to the presence of this mystic something we are pleased to call murmur.

Too often incorrect diagnoses are made, improper treatment is instituted and many subjects made introspective. Do not attach too much importance to finding a murmur. If you go back to the days of Corrigan and Walsh and in this country to the time of Da Costa and Flint, you will observe that all hinged upon the location, the time and quality of the murmur, that the diagnosis, prognosis and treatment rested almost entirely upon the stethoscopic findings. Fortunately that day is passing, but it has not passed rapidly enough. Let us go back to our college days, say thirty or thirty five years ago and remember what we were taught. The classification of murmurs hitherto has been burdensome. We have been told about endocardial murmurs, extracardial murmurs, cardiorespiratory murmurs, dynamic murmurs, anemic murmurs, accidental murmurs and others. There is no classification that is really satisfactory, but in time we trust cardiologists will reach a standard as to classification. For a working basis MacKenzie has classified murmurs as physiological, functional and organic.

In studying cardiac affections I wish to impress upon you that the presence of a murmur is the least important of all of our findings. It does not matter whether the murmur is physiological, functional or organic. Perhaps the question might arise in the minds of some, can we have a murmur where the heart is perfectly normal? Can we have a functional murmur when there is no evidence of organic disease? Can we have an organic murmur in which the prognosis is good and in which case the patient may live out his allotted time and die from some intercurrent trouble? All these questions can be readily answered in the affirmative. Perhaps some

may ask what we mean by a physiological murmur. We are able to answer this question by citing the presence of a murmur in young adults in whom there has been no history of previous infection; where the patient is in the pink of health, and is not conscious of the presence of a murmur until informed by the physician. These physiological murmurs have their analogue in the high pitch respiration so frequently found particularly over the apex of the right lung in children and young adults. The question of physiological murmurs in young people perhaps is a question of biology, biochemistry; a physiological, anatomical, histological, embryological question. In proportion to the degree that the arteries, myocardium and valves develop into maturity the murmur will disappear.

We are hearing a great deal today about functional tests. The whole medical world has turned on its head with reference to functional activity, to the detriment of pathology. When we use the term functional murmur the thought intrudes itself as to its nature. In truth it seems that functional murmurs in a measure, in many instances can be used as a synonym of physiological murmurs. In other words if we test out carefully through a system of exercise the heart muscle, estimate the size and condition of the heart by palpation and auscultation and find everything working well, for the want of a better term we can use the generic term, functional murmur. I have been accustomed to classify these physiological and functional murmurs as benign in that they are of but little importance and have slight bearing on the cardiac state.

It will not be necessary to dwell upon organic murmurs except to say that when found, the history of the case together with other physical findings will place the value of a murmur where it belongs.

Graham Steele, another eminent English cardiologist, has said: "No one ever dies from mitral regurgitation." He stated that when the heart failed where there was a mitral systolic murmur present, heart failure had occurred, not because of the regurgitation, but because there were present other factors which provoked it, such as some myocardial disease or impairment. "This was so opposed to the conception of heart failure by back pressure which I had been taught to accept that I carefully observed my patients to see whether or not it was true; and now I can fully endorse Graham Steele's diction."—MacKenzie. What Graham Steele has said about mitral lesions can as well be said about aortic lesions. Hitherto we have laid too much stress on the term and diagnosis valvular lesion. How often do we see death certificates signed, "organic valvular lesion of the heart." In any given case of heart disease the results of previous infections, whether the condition be of long duration and chronic or acute, the condition at the valve has but little to do with the death of the patient. In other words the valve lesion *per se* is merely a part of the general pathological cardiac condition. MacKenzie has well said in any infection of the heart no one tissue is absolutely attacked. The infection frequently spends its force on the entire cardiac structure, namely valvulitis, endocarditis, pericarditis, myocarditis blended to make the sum

*Read before the Mississippi State Medical Association, May 12, 1920.

total of the cardiac pathological condition carditis. Our whole attention must be directed in the management of any given case to the heart muscle and its sac, the pericardium, and its lining membrane, the endocardium. From our accumulative knowledge of cardiac disease where there is a pathological condition in the valves associated with changes taking place in the cardiac structure, when compensation fails, we can use the hyphenated term, myocardial valvular insufficiency. Reverting to the clinical significance of cardiac murmurs their only significance is determining what valve is affected, if organic; how much enlargement there is of the heart; what symptoms are present; the nature of the infections that lead to the valvular defect; the age and general nervous makeup of the patient.

Given a case we will say of mitral insufficiency the result of rheumatic endocarditis, in either adult or child, if we find a systolic murmur at the apex possibly not transmitted further than the axillary line, with the apex beat in the normal line, the apex beat not diffusible nor tumultuous, with the pulse normal, the pulmonic second sound not markedly accentuated, with no symptoms of dyspnea, no enlargement of the liver, nor evidence of stasis anywhere, we can assure the patient that the condition is of but little moment and not to be regarded with too much disquietude. It is well in this type of case to put the patient through a strenuous gymnastic exercise and test the heart after the exercise to estimate the reserved integrity of the heart muscle. Where the heart responds and shows no evidence of a weak myocardium, making this demonstration to the patient is quite often a valuable aid in reassuring him that his condition is not serious. A great many of these patients come to me either with strychnine tablets or with tincture of digitalis. In such cases giving strychnine and digitalis or any cardiac tonic or stimulant is like handicapping a well bred race horse on a smooth track. How often have I seen these patients' nervous systems tuned to high C by the strychnine they are taking and the heart muscle made irritable by the injudicious use of digitalis. In such cases there is no indication whatsoever for medical agencies. The psychic condition needs more treatment and attention than the heart needs medicine. Too often these patients are put to bed to take rest treatment without due consideration and weighing all the evidence. They become markedly introspective while in bed and are constantly watching the heart. Exercise and mental diversion are what they need and not rest.

Now as to physiological murmurs, they are nearly always systolic in time and at the apex. They may be distributed over the entire precordium. The heart is never enlarged and the history as to infection is nearly always negative. There is not much area of transmission; the heart responds to all tests. These physiological murmurs are too often confused with the true organic mitral regurgitation, merely by the findings of a systolic apex murmur. A careful physical examination of the patient, however, can easily decide the question in many instances. The late war has taught us some valuable lessons with reference to cardiac diagnosis. Some of the long accepted views have been reversed. Since the war

I have examined numbers of patients coming out of base hospitals with a diagnosis of mitral regurgitation, when upon a most searching stripped examination and a thorough review of their history I could find nothing to justify the diagnosis except a slight systolic whiff at the apex. I am quite satisfied that numbers of men on examining boards making these examinations were young amateurs, who had not been sufficiently trained in physical diagnosis. I quite agree with MacKenzie when he says, "Perfectly healthy men have been rejected from the army, or invalidated out of it, because a murmur was detected in their hearts. Others who present themselves for life insurance are rejected or made to pay a higher premium for the same reason, while innumerable individuals are subjected to prolonged treatment and great restrictions in their mode of life because these early superficial observations have misled the profession." The question of life insurance in its relation to heart murmurs concerns all medical examiners. Were I the chief medical examiner of any life insurance company the detecting of a murmur without other findings would not deter me from issuing a policy without extra premium.

Diastolic murmurs are practically always organic. Just why this is true no cardiologist has yet been able to give a reason. We have for a working basis but two diastolic murmurs of consequence, namely, that of aortic insufficiency and the late diastolic murmur of mitral stenosis. So far as I am personally concerned I have never been convinced, from the quality of the murmur upon auscultation in mitral stenosis, that it is diastolic. Personally, I am content to classify the murmur so typical and characteristic in mitral stenosis as presystolic. I have been much amused of late in reading the superabundance of literature upon the subject in army and base hospitals as to the question of this lesion. I read an article not long since in which the statement was made that the author did not consider the presystolic murmur of any consequence, that he had discarded its significance, and that it was not considered at all in a diagnosis of mitral stenosis. I do not think that any cardiologist of broad experience can accept this dictum. In fact, the presystolic murmur, or as some call it the late diastolic murmur, is as characteristic of mitral stenosis as the diastolic murmur is of aortic insufficiency. Personally, I would not be satisfied with the diagnosis, particularly where there is perfect compensation, without the presence of this distinctive murmur. In fact, the presystolic thrill over the apex on palpation and the presystolic murmur on auscultation clinch the diagnosis. In aortic insufficiency, whether endocardial or arteriosclerotic, the diastolic murmur at the base is just as distinctive as the presystolic murmur at the apex in mitral stenosis.

In conclusion, let us remember that in organic cardiac lesions the finding of a murmur is merely an aid to the diagnosis and is to be considered as the least important of all of our findings; that physiological and functional murmurs are of but little consequence and must not be confused with organic murmurs. Let us be careful and painstaking in history taking and in a thorough physical examination of the patient in making any estimate.

FISSURE FRACTURE OF THE TIBIA.

*With Reports of Cases.*BY JACOB GROSSMAN, M. D.,
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Orthopedic Clinic, Stuyvesant Polyclinic; Instructor of Ortho-
pedics, New York Postgraduate Medical School.

Fissure fracture, also known as subperiosteal, intraperiosteal, linear and oblique fracture, is one in which the bone breaks or cracks inside the thick periosteum, as a willow bough cracks without tearing its bark. The commonest site of this type of fracture is in the tibia. Only one was found elsewhere and that was in the fibula. This case was reported by me (1) in 1916. Fissure fracture is especially found in children and results from direct trauma, such as a falling object striking the leg, or a fall striking upon the leg.

ETIOLOGY

In this series there were twenty-one cases. Of these sixteen or eighty per cent. were in males and five or twenty per cent. in females. Ten were in the left tibia and eleven in the right. Nineteen or almost ninety-five per cent. occurred in children who were below ten years of age. One occurred in a boy of thirteen and the other in a boy of fifteen. The youngest child was twelve months of age. The commonest cause was a fall, the patient striking upon the affected leg. The distance of the fall varied. In some instances the patient fell from a high chair, in others down the stairs, a distance of one or two steps, in others they fell on level ground. In a number of instances the trauma was very mild.

SYMPTOMATOLOGY

The subjective symptoms varied from mild cases to very severe ones. In some instances the pain and disability were slight. The pain was especially evident when the child attempted to walk or when the affected limb was manipulated. The subjective symptoms in a number of instances were so mild that the mothers were surprised to learn of the presence of a fracture. In others the pain and disability were so severe that the patients refused to walk and would not permit the slightest manipulation of the affected leg. Disability was marked.

The diagnostic objective symptom is pencil tenderness. It is excruciating in character and can be mapped out by means of the rubber tip of a pencil, which is made to exert pressure over the area of trauma. The line of fracture can be traced by this means in a large number of instances. This symptom may persist for months. There may be slight swelling and ecchymosis around the site of fracture. A limp on the affected side was usually present. Crepitus, false mobility and deformity were always lacking.

DIAGNOSIS

The diagnosis is usually made by mapping out the pencil tenderness and confirmed by subsequent x ray pictures. It is essential that the x ray pictures be taken in several planes as the fracture may show in one plane only. This plane, as has often been the case, may be omitted, and the fracture may be overlooked.

In sprains and contusions the tenderness is as a rule more generalized than it is in fissure fractures. There are no areas of pencil tenderness in the former conditions. Tenderness and pain in sprains and contusions do not persist for as long a period of time as they do in fracture.

In one of our cases the fissure fracture was accompanied by a luetic osteoperiostitis of the tibia. The luetic infection was responsible for the persistence of the symptoms for months after the injury had been sustained. The history of the case in point follows:

CASE I.—The patient was a boy, ten years of age, who had met with an accident in which his leg was injured. He was taken to a clinic where a diagnosis of fracture of the tibia was made and proper treatment instituted. His leg was encased in plaster of Paris bandages and maintained in this fashion for several weeks. In spite of this immobilization the pain persisted. He came to our clinic several months later complaining of pain and a limp. Examination disclosed slight swelling about the centre of the shaft of the tibia. Tenderness in the same region was marked and localized. Ecchymosis, crepitus, false mobility and deformity were lacking.

It was quite evident that something beside the old injury was responsible for the symptoms. Examination of the eyes disclosed that the pupils were unequal and irregular, responding rather sluggishly to light. The teeth showed humpy molars, dental interspacing and fluting (Roberts). These latter findings suggested a possible luetic infection. Closer questioning of the mother disclosed the history of a primary infection about the time that the patient was four months of age. As she nursed the child at the time the infection was traced to that source. Subsequent blood examinations of both child and mother were made and the Wassermann was four plus. An x ray picture of the affected leg was taken and it showed an old fissure fracture and a syphilitic osteoperiostitis of the tibia.

The subsequent course of the case under treatment further confirmed our findings. The pain and disability disappeared under mixed treatment. This case is mentioned to emphasize the necessity of bearing in mind the possibility of lues being responsible for persistent pain and disability following an injury.

COURSE AND PROGNOSIS

The prognosis is excellent. The patient usually recovers within a few weeks. The pencil tenderness persists for an indefinite time after the pain and disability have subsided.

TREATMENT

The treatment consists of immobilization by means of plaster of Paris bandages. The bandages are retained for a period of two weeks when they are removed and baking and massage are given. The average length of treatment was four weeks.

It is unnecessary to report in detail the entire series of cases. The following six reports present the main features occurring in fissure fractures.

CASE II.—C. R., three and a half years of age. Three weeks before coming to our clinic, the child tripped and fell. She was taken to her family physician and local applications with rest were prescribed. In spite of faithfully carrying out these directions,



FIG. 1—Fissure fracture of the tibia. (Case II.)

the pain and disability persisted. It was for these symptoms that the child was referred to us.

The child was unable to walk, having been carried to the clinic by her father. Her leg was slightly swollen in the region of the tibial crest. Ecchymosis, crepitus, false mobility and deformity were lacking. There was, however, a line of pencil tenderness localized to the tibia and extending for a distance of about two inches. A diagnosis of fissure fracture of the tibia was made and a subsequent x ray picture confirmed the diagnosis (Fig. 1). The patient made an uneventful recovery.

CASE III.—M. O., seven years of age, fell striking upon his leg. He was brought to our clinic several days later, on account of pain and slight disability. The patient walked with a slight limp on the affected side. Ecchymosis, false mobility and deformity were lacking. There was slight swelling over the affected area. Pencil tenderness extending for a distance of about three inches was traced along the tibia. A diagnosis of fissure fracture was made and a subsequent x ray picture confirmed the diagnosis (Fig. 2).

CASE IV.—J. F., three years of age. A few days before being brought to the orthopedic clinic of Lebanon Hospital, the patient fell, striking upon his left leg. No attention was paid to the accident as he was able to get about. For the following few days the child complained of pain especially evident when he walked. The patient walked with a slight limp on the left side. The leg was swollen, there was no deformity, ecchymosis, crepitus or false mobility. A line of pencil tenderness was traced along the shaft of the tibia for a distance of two and

a half inches. A diagnosis of fissure fracture of the tibia was made and proper treatment instituted. A subsequent x ray picture confirmed the diagnosis. The patient made an uneventful recovery.

CASE V.—S. R., eight years of age, fell, striking upon his left leg. Complained of pain and a limp. There was slight swelling and ecchymosis over the upper part of the leg. Crepitus, false mobility and deformity were lacking. A line of pencil tenderness was traced for about two inches, along the upper part of the tibia. A diagnosis of fissure fracture of the tibia was made and a subsequent x ray picture confirmed the diagnosis. The patient made an uneventful recovery.

CASE VI.—H. S., fifteen years of age. About five weeks before coming to our clinic, the patient fell and hurt his right leg. Disability and severe pain followed. Ecchymosis and swelling localized in the centre of the leg were evident. Pencil tenderness was traced along the shaft of the tibia for a distance of about three inches. A diagnosis of fissure fracture of the tibia was made and a subsequent x ray picture confirmed the diagnosis. The patient made an uneventful recovery.

CASE VII.—S. S., four years of age, fell, striking upon his right leg. For a few days thereafter he complained of pain only when walking. The mother noticed that he limped. The patient walked with a limp on the right side. There were slight swelling and ecchymosis over the lower part of the

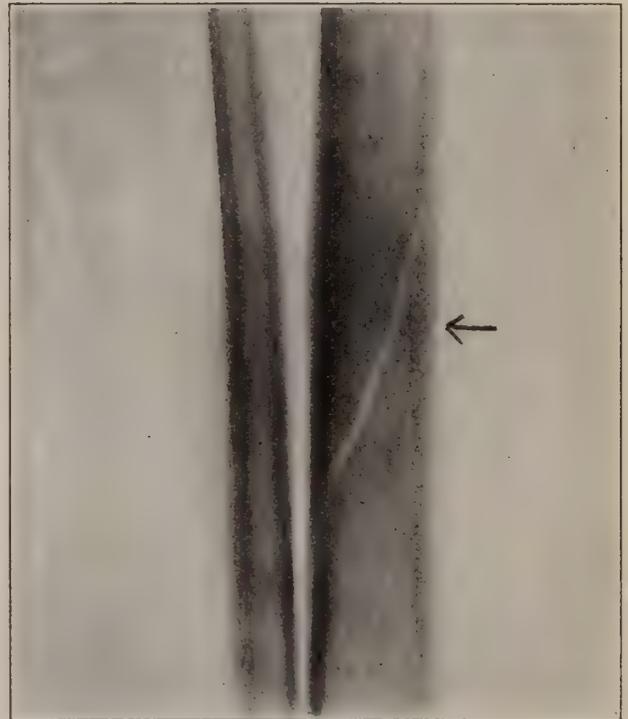


FIG. 2—Subperiosteal fissure fracture of the tibia. (Case III.)

right leg. A line of pencil tenderness was traced along the tibia for about an inch. A diagnosis of fissure fracture of the tibia was made and a subsequent x ray picture confirmed the diagnosis. This patient fell again a few weeks after he was discharged, and injured the same leg. Examination

again disclosed a fissure fracture a little higher than the previous one had been.

SUMMARY AND CONCLUSIONS:

1. Fissure fracture occurs mostly in children.
2. The tibia is usually the site of the fracture, only one case having been seen in the fibula.
3. The subjective symptoms and the disability may be mild.
4. Fissure fracture should be differentiated from sprains and contusions.
5. The presence of a luetic infection in the bone, as a factor prolonging the duration of the symptoms, should not be overlooked.
6. False mobility, crepitus and deformity are always lacking in this type of fracture.
7. The diagnostic objective symptom is pencil tenderness. It is always present and persists for an indefinite period of time after the accident has occurred.
8. The recognition of the type of fracture is important, not only from a scientific viewpoint, but also from a medicolegal viewpoint.

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THE INTRAVENOUS TREATMENT OF MALARIA.

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Evolution is a law of nature. Evolution in the science and art of medicine has changed fundamentally methods of treating disease. From the primitive method of drug administration *per os* to the giving of medicine by the hypodermic syringe, was a long step forward. From the subcutaneous injection to the intramuscular injection was a logical evolution. From the intramuscular injection to the intravenous injection was inevitable. It had to come. It is here to stay. There is every argument for, no argument against intravenous therapy. Once admitted that the blood is the medium in which medicine is carried to every organ, tissue and cell of the body, there is nothing to contradict the conclusion that to introduce medicine directly into the blood is simpler, surer and even safer than to depend upon its reaching the circulating medium after having run the gauntlet of digestion, alteration, and modification by its passage along the gastrointestinal tract. There is a saving of time and effort and a prevention of imperfect action and uncertain effect.

At the present time and under modern conditions there is absolutely no logical or actual argument or objection to the intravenous method of drug administration. The work of certain pharmaceutical chemists has made possible the preparation and supply of solutions containing indicated drugs in a form entirely safe for intravenous administration. Thousands of physicians all over the world are taking up and employing the intravenous method. As the result of an extended experience I can definitely state that dangerous reactions or uncertain or negative results are conspicuous by their absence,

providing properly prepared solutions are employed. Their technic is simple, so simple, in fact, that a physician who is not qualified or able to make an intravenous injection is not qualified to practise medicine at all.

The number of physicians who depend and insist upon the intravenous method for administering iron and arsenic in anemia is steadily increasing. The same is true of the intravenous use of iodides, especially of sodium iodide. Furthermore, and as would naturally and logically be expected, the intravenous method was quickly applied to the administration of quinine in malaria. As a matter of fact, it is in malaria that the proof of the superiority of intravenous therapy over all other methods is being conclusively established.

The treatment of malaria in its various forms is by no means simple, and, if one may judge from the literature regarding it, in many cases unsatisfactory. Quinine, while it was long ago hailed as a specific for malaria, does not always act as such. Moreover, there is in malaria another element always present which, in a general way, may be referred to as anemia, which complicates matters, and which almost always requires careful treatment. There has been a change in recent years in the interpretation of the meaning of the classic symptoms of malaria—the chill, the fever and the sweat. These used to be attributed to the development of the plasmodium and the hatching out of a brood of plasmodia in the blood stream. Recent observations, however, go to show that at this stage the erythrocyte is hemolyzed. Hence the destruction of the erythrocyte with the resulting hemolysis is probably the cause of the reaction rather than the digestion of the protein of the plasmodium. Hemolyzed erythrocyte is known to cause serious reaction and to have even caused death. Hence, conclusion points to the resistance of the erythrocyte to the malarial plasmodium as the factor that determines the extent and severity of the malarial attack. It is known that each malarial attack is followed by evidence of great destruction of erythrocytes, followed by persistent and in many cases profound anemia. Recovery from anemia means practically recovery from malaria. Every study of malaria indicates that the destruction of the red cells and hemoglobin and the recovery from such a condition is a true index of the status and severity of infection. That this is true is indicated by the fact that arsenic, long recognized as a valuable remedy in malaria, particularly in chronic forms, owes its therapeutic value to its physiological action in preventing the destruction of the erythrocyte.

The red corpuscle is the chief actor in malaria. It is not alone the site of infection, but it is the most active agent in resisting the infection. Observers have reported favorable results in severe malarial infection from the use of salvarsan, and there has been placed on record a report in which the use of mercury was followed by beneficial results. Consequently, in the consideration of the effective treatment of malaria, it may be divided into two heads—first, the proper and most effective method of administering quinine in order to secure its maximum effect upon the malarial organism, and

second, and quite as important, the administration of iron and arsenic (iron cacodylate) in order to replenish the supply of erythrocytes and hemoglobin. One does not have to go far into medical literature before finding many references to the drawbacks and inefficiency of the administration of quinine, in malaria, by the mouth, e. g., MacGilchrist (1) declares that very little quinine is absorbed by the stomach, and that any absorption is due to the fact that quinine is a very diffusible substance.

In the attempt to get better results from quinine than are obtainable from its administration *per os*, numerous observers recommend its use by subcutaneous or intramuscular injection. Definite proof, clinical, as well as experimental, showed, however, that when a concentrated solution of a quinine salt, e. g., five or ten grains in thirty minim syringe, is injected into the muscles or under the skin, most of the quinine is precipitated at the site of the injection, and remains there for many hours. The tissues at the seat of injection are killed, giving rise to so-called abscesses and fibrous nodules, or, if the injection is made very superficially, to sloughing and ulceration.

It was, of course, inevitable that the suggestion should arise that the intravenous use of quinine in malaria would prove of great advantage. Several surgeons in the Medical Corps of the United States Navy resorted to the intravenous method and reported excellent results.

Thomson (2) made still further contributions to this important subject. He pointed out that the intravenous route for the administration of quinine in malaria was first used almost exclusively in emergency cases, especially those in which the patients were suffering from what has been termed pernicious comatose remittent malaria. He explained that the intravenous method had other advantages to recommend it; that it is the only route by which one can concentrate upon the parasite and thereby obtain the maximum effect at the optimum time. Thomson employed the twenty per cent. solution of the bihydrochloride of quinine. He concluded that the intravenous route has special advantages in the treatment of malaria during the active periods of the disease. By this means, the full quantity of quinine given can be concentrated against the parasite at the moment when it is most susceptible to such action and the maximum effect obtained.

In eighteen consecutive cases of malignant tertian malaria with remittent fever and with ring forms of *Plasmodium falciparum* present in the peripheral blood a single intravenous injection of fifteen grains of quinine bihydrochloride was sufficient to break the attack in every case. All stages of the schizogenous cycle of *Plasmodium vivax* present in the circulating blood were directly affected by the injection. The mature gametocytes of *Plasmodium vivax*, unlike those of *Plasmodium falciparum*, disappear from the peripheral blood under the direct action of quinine bihydrochloride given intravenously. In cases of benign tertian malaria, the patient's comfort will be considered without the parasite being spared if the first intravenous injection be given at the very end of a severe stage.

Subsequent intravenous injections should be timed to be given at what would have been about the beginning of the severe stage in the paroxysms next in order had the cases remained untreated.

In an original communication John C. Clark (3) of Memphis, Tenn., discusses the intravenous injection of quinine bihydrochloride and cacodylate of iron in treatment of chronic malaria. He reported his experience, both as to the results obtained and the reactions which were manifested. In fifty-seven cases of chronic malaria seen in private practice in the year 1917, 467 intravenous injections of quinine bihydrochloride in combination with cacodylate were given. The author states that he never saw a reaction which did not right itself within the time expected. The results were gratifying. Of fifty-seven patients reported, thirty-two were under treatment for forty days or more; the remaining twenty-five patients were given from one to five injections for relief only. Of the thirty-two patients, twenty-seven were kept under observation and in only two instances was there any evidence of a relapse. There was an average increase of red blood cells of 1,125,000 with a hemoglobin increase of about forty per cent. At the time treatment was discontinued, it was impossible to demonstrate the malarial organism in any form, or to detect any other evidence of malaria.

Carnot (4) commends the intravenous route as simple and not at all dangerous, when it is a question of striking quick and striking hard. He states that the sterilizing effect of the quinine is reenforced by this route.

L. Rogers (5) states that the intravenous administration of quinine in primary attacks of malaria appears to be worthy of careful trial, because a further material advantage of such intravenous administration is likely to be that dangerously large infections, which may terminate at any moment in fatal coma under oral administration of quinine, are likely to be rapidly controlled. He predicts that by this method, the present mortality from malaria should be reduced to practically nothing.

Knowles (6) asserts that the intravenous administration of quinine in concentrated solution is the quickest and surest method of immediately cutting short a febrile attack of malaria. It appears to be a perfectly safe method, and is infinitely preferable to intramuscular injections from every point of view. He declares that there is quite a sufficient amount of evidence now available to justify the routine and extensive use of quinine intravenously.

Barbary (7) reports that he has been treating malaria during the last ten months by intravenous injection. He has treated 899 patients at the military hospital at Nice, and comments most favorably on the prompt and effectual action of this route. The injections were given every third day at first and then at five day intervals. Hence, it will be appreciated that the use of quinine intravenously in the treatment of malaria has long passed the experimental stage and is coming to be regarded as the most efficient, least dangerous, and therefore, most to be preferred method. It may be assumed, however, that in the treatment of malaria, whether in the acute or chronic form, the intravenous ad-

ministration of quinine should be employed with every expectation of success, so far as any effect upon the malarial parasite is concerned. There remains, however, the element of anemia which is always present and which always demands or should demand careful treatment.

M. R. Lawson (8) shows that multiple infection of red corpuscles with young parasites is seen in all malarial infections, but is found most frequently in estivoautumnal infections. The anemia in malarial infections is explained in Lawson's opinion, by the fact that each parasite destroys several red blood cells. Reduction of hemoglobin out of proportion to the loss of red corpuscles is explained by the fact that there is always a partial loss of hemoglobin in certain of the surviving corpuscles due to parasitic action.

Deillille and his coworker (9) report that the findings in the malaria contracted by the French troops in Macedonia show a relative frequency of hemoglobinuria, indicating massive destruction of blood corpuscles, probably in the blood stream, as the first phase. This may be accompanied by hemorrhages from the mucosa.

Netter (10) reports that in thirty-seven malaria patients, the blood corpuscles displayed greater resisting powers during the malarial attacks than at other times. He queries whether it might not be possible to sustain and prolong this by other measures to combat hemolysis. The query is answered in part by Neff. He reports five cases of tertian malaria treated with arsenic intravenously. Neff states that there is room for improvement in the treatment of malaria and that the disease is often resistant to permanent cure by the administration of quinine alone. Disappearance of fever is often taken as evidence of a cure. Given rapid destruction of red blood corpuscles and marked reduction in hemoglobin, the suggestion immediately presents itself that in iron and arsenic a remedy capable of accomplishing the second indication in the treatment of malaria, viz., to overcome the anemia and restore the blood to its normal condition. It has long been known and recognized when given by the mouth in postmalarial anemia.

In view of recent clinical reports, as well as from the theoretical view point, there is every reason to expect better results in a shorter length of time when iron and arsenic are given by the intravenous route. Iron and arsenic given intravenously have been found of special value in the treatment of non-malarial anemia; e. g., Geysler (12) reports ten cases treated with a combination of iron and arsenic given intravenously, pointing out that it is possible to demonstrate a positive increase of red cells after each infection and that results occur with a certainty and rapidity that all their efforts have heretofore failed to bring about. He states that positive clinical results can be obtained by stimulating the white and red cells, providing a remedy, the pharmacological action of which is known, is administered by this direct method into the blood stream. Stern (13) reports over 100 cases treated with iron and arsenic intravenously.

PELLAGRA.

What is true of the anemia which forms such a prominent feature in malaria also holds true of pellagra, which is invariably accompanied by a diminished amount of hemoglobin and impaired resistance on the part of the erythrocyte. Recovery from pellagra is invariably associated with recovery from the anemia, which is its characteristic feature. Perhaps the main object of treatment is to increase the number, quality and resisting power of the erythrocytes, together with an increase in hemoglobin and the bringing the blood back to normal. For obvious reasons, iron and arsenic may be relied upon to do this, provided they can be introduced into the body in such a way as to enable them to exert a thorough and free physiological and therapeutic effect. This means, naturally, by the intravenous route.

Perhaps the greatest objection that has been raised to the employment of quinine, iron or arsenic, intravenously, has had to do with the difficulty and possible danger incurred in the extemporaneous preparation of solutions of these drugs for such use. Experience with the administration of salvarsan and others of this group has impressed upon the minds of many physicians the fact that

CASE I.—Tertian Malaria:

Patient had been having chills six weeks, very emaciated. Intravenous injection quinine May 25th, 26th, 27th, 28th, 29th, June 1st, 3rd, 9th, 16th, 23rd, alternating with 5 c. c. iron and arsenic solution at intervals twice a week until August 9, 1919.

May 25, 1919.
red cell count, 3,000,000
hemoglobin, 60 per cent.
white cell count, 18,000

August 27, 1919.
5,200,000
98 per cent.
6,500

CASE II.—Quotidian Type:

Intravenous injection 5 c. c. quinine every day for seven days. Alternating twice a week each with 5 c. c. iron and arsenic solution until August 7, 1919.

June 2, 1919.
red cell count, 4,500,000
hemoglobin, 70 per cent.
white cell count, 3,500

August 7, 1919.
6,180,000
95 per cent.
8,000

CASE III.—Quartan Type:

Intravenous injection every day for seven days; every other day for fourteen days alternating with iron and arsenic, 5 c. c. solution, until August 27th.

June 5, 1919.
red cell count, 3,400,000
hemoglobin, 40 per cent.
white cell count, 2,000.

August 27, 1919.
5,000,000
100 per cent.
6,000

CASE IV.—Quartan Type:

Intravenous injections 5 c. c. quinine solution every day for seven days, every other day for twelve days. Then alternating twice a week with 5 c. c. solution iron and arsenic until July 19, 1919.

June 7, 1919.
red cell count, 4,100,000
hemoglobin, 75 per cent.
white cell count, 4,000

July 19, 1919.
5,400,000
95 per cent.
7,000

CASE V.—Quartan Type:

Intravenous injection 5 c. c. quinine every day for eight days, every other day for sixteen days. Then twice a week, alternating with iron and arsenic solution 5 c. c. once a week until August 27, 1919.

June 6, 1919.
red cell count, 4,200,000
hemoglobin, 55 per cent.
white cell count, 10,000

August 27, 1919.
6,000,000
90 per cent.
6,000

unless special precautions are observed and correct technic followed, dangerous reactions are to be expected.

My experience with the intravenous method extends over a period of two years, during which time I have treated thirty-two cases of malaria. Quinine was administered in the form of a five c. c. solution containing five tenths grain of quinine bichloride. The iron and arsenic were contained in the five c. c. solution representing sixty-four mg. The number of cases treated with iron and arsenic alone and the results that I observed, justify me in stating that not alone is the intravenous method indicated in the treatment of malaria, but the results obtained lead one to conclude that the action of quinine in malaria is due to its effect upon the red corpuscle rather than to a plasmodial action. The fact that iron and arsenic stimulate an increase in the number of erythrocytes and their resistance, is well founded in medical experience. However, the prominently positive and uniform results from the intravenous administration of iron and arsenic as indicated in my experience cause me to state that this is the ideal treatment of malaria. The case histories given indicate the results I have obtained.

These cases were selected out of a total of thirty-two. Twenty-seven similar cases treated by the same method have convinced me that the action of quinine given intravenously upon the plasmodium is evident during every stage of the life cycle in man. The effect of the drug varies with the time of administration and the size of dose given. If quinine is continued, the blood being examined at regular intervals, it will be found the plasmodia diminished greatly in number up to the time of sporulation, proving that in every stage of the growth, quinine is capable of destroying them. To combat the anemia, and restore the individual to his normal tone, I have always given intravenously, five c. c. solution of iron and arsenic until hemoglobin and blood count become normal.

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Treatment of Entropion.—Jacqueau (*Lyon médical*, March 25, 1920) reports a case of spasmodic entropion by the use of a Michel clamp fixed in a vertical position above the eyelid. The measure is recommended as very simple, practically painless, requiring no dressing, and giving the best results, notably in postoperative spasmodic entropion.

INTRAVENOUS MEDICATION.

BY CHARLES GREENE CUMSTON, M. D.,

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Given the great interest shown in, and the considerable progress made of late in intravenous medication, I propose to offer a brief review of the subject as it stands on the Continent. It is true that many physicians are perplexed by the simple phenomena following intravenous injections of various substances, given under the names of hemoclastic crisis, peptonic or anaphylactic shock, but in order not to confuse the subject still further by discussing the differential reactions, the experimental results shall not be referred to—although many are of unquestionable interest—and, therefore, only the clinical aspects need be examined, passing in review the simplest to the most complex injectable substances with the opinions of the observers most competent in the matter.

In septicemias resulting from wounds, especially war injuries, Audain and Masmonteil have employed intravenous injections of an isotonic solution of sugar—glucose, saccharose or lactose—as a leucogenous procedure which, by increasing the number of leucocytes, heightens the organic resistance to infection. During the past year, Humbert, of Geneva, has also resorted to intravenous injections of sugar in pulmonary tuberculosis with good results.

The leucogenous action of sugar given intravenously is, in reality, quite remarkable, because within thirty minutes after the injection the leucocyte count reaches from seven to twenty-five thousand and remains at this figure for two to three hours, afterwards falling to about fifteen thousand. According to Audain and Masmonteil, the injections produce quite as marked reactions as the colloid metals, sodium nucleinate, etc. The leucogenous action manifests itself clinically shortly after the injection by a transitory rise of temperature of a few tenths of one degree, ushered in by a severe chill and followed by a sudoral crisis similar to a paroxysm of malaria. The thermic maximum corresponds with the maximal phase of hyperleucocytosis, but these phenomena are those met with following the injection of any leucogenous substance, especially when given intravenously. The phenomena of reaction are proof of leucocytic changes and are consequent upon the sudden and massive introduction of foreign bodies into the circulation.

It is not to our purpose to enter here into a discussion of the scientific aspects of the leucogenous action. Suffice it to say that intravenous injections of sugar first produce a chill, a slight rise of temperature and sudation, accompanied by leucocytosis and afterwards by a fall in the temperature, with a normal pulse rate, profuse diuresis, and an amelioration of the principal symptoms, but sometimes followed by a painless abacterial abscess. These results may be permanent, but usually the injections must be repeated several times.

In a lecture delivered at the Paris Faculty of Medicine last year on intravenous injections of peptone in infectious diseases, Professor Nolf, of Liège, pointed out the phenomena which resulted, as follows. "The immediate result depends upon the dose

injected. If it is equal to or less than one centigram for each kilogram of the patient's weight—a patient of medium build receiving from five to six c. c. of a ten per cent. peptone solution—a rise of temperature usually occurs one or two hours after the injection and lasts for several hours. If the dose is a little stronger—from seven to ten c. c. of a ten per cent. solution—the same initial rise is observed and may be ushered in by a more intense chill, the onset being usually about one hour following the injection. The chill lasts from twenty to thirty minutes and is followed by a phase of heat of 101° to 102° F., after which a phase of sudation is prone to occur. When the sweating takes place, the temperature will have already fallen a little, but continues to drop rapidly as the sudation increases, so that within three or four hours after the onset of the sweat it will have become normal or nearly so, and remains normal for some time."

The thermic drop referred to by Nolf is accompanied by a general amelioration; in typhoid fever especially, the abdominal distention, prostration, delirium, insomnia, and signs of bronchitis diminish or even disappear. It is hardly necessary to say that in two or three days the phenomena of the infectious process return, but if the injections are given every second day a marked drop in the temperature will be maintained which in itself is advantageous to the patient.

Nolf does not insist upon the leucocytic reaction, but it is known that it exists, both by experimental work and direct clinical examination of patients having received peptone injections. On the other hand, Nolf refers to certain disadvantages of the injections when they are given too often or in too large doses in profoundly infected subjects. A syndrome develops consisting of dyspnea, tachycardia, hypotension, distress, and sometimes a more or less extensive urticaria, which Nolf compares to anaphylactic shock, but which he nevertheless designates under the term of peptonic shock.

Peptonic shock is, in reality, a German invention, which was put forth by Schmidt-Muhlheim if credence is to be placed on German assertion. At all events, it has been studied in France by Gley, Hédon and especially Delezenne, the latter showing that the shock may be brought about by very different substances—toxins, vaccines, extracts of organs. But why peptonic shock, since Nolf himself admits that intravenous injections of colloidal metals give rise to similar phenomena? To this Nolf replies that the colloidal metals are stabilized with organic substances—gelatin, serum, peptone—and it is these substances and not the colloidal metals which give rise to the accidents which follow. Unfortunately this argument is not acceptable, as Laumonier justly points out, because Bredig's colloids—which contain nothing but the powdered metal and pure water—produce reactions in every point comparable to those resulting from stabilized colloids, but also to peptones and sera.

Briefly, as to the nature of peptonic shock, all that is essential to remember is that intravenous injections of peptone first give rise to a chill, then to a rise of temperature and sudation, as well as to various forms of distress, hypotension, and tachy-

cardia, grouped under the name of peptonic shock, and accompanied by a hemoclastic crisis—leucopenia, hemolysis, etc.—which shall be referred to later on; then a thermic drop and an improvement in the general symptoms lasting, in the average case, for two to three days. It is also to be observed that the peptone injected is soluble and assimilable as an ordinary food, but it is supposed to have the property of an antigen, that is to say, when injected into the organism it produces new specific antagonistic bodies, a conception whose insufficiency shall be shown later on.

Of late, serotherapy, autoserotherapy and plasmotherapy have been frequently resorted to. They have been utilized especially during the epidemic of influenza in 1918. Among these various trials, whose results are, in reality, absolutely comparable, that of Lesné, Brodin and Saint-Girons may be selected, since it is one of those which offers the broadest field for interesting consideration. It consists in intravenous injections of from fifty to two hundred and fifty c. c. (maximum dose) of blood plasma of convalescent subjects, normal subjects or even autoplasm, in patients presenting complications during influenza or typhoid. When the patient reacts, which does not always happen, the phenomena already referred to develop.

Most observers maintain that, in a general way, at the end of from fifteen to sixty minutes there is a general chill and a sensation of cold with headache. Then the rectal temperature goes up to 101° to 102° F., even to 106° F., the pulse rate at the same time increases, while the blood pressure decreases. This state lasts from twenty to forty minutes, then the chill subsides, the headache disappears, sudation takes place, and the patient has a sense of wellbeing. The temperature quickly drops below its former level and ranges around 98.6° F., where it will remain or not, according to the case. This reaction is identical with that following the injection of horse serum in septicemia. It is also like Nolf's peptone reaction and near to anaphylactic shock, whose vascular blood manifestations have been comprised under the name of hemoclastic crises by Vidal, Abrami and Brissard. It is to be remarked that Lesné, Brodin and Saint-Girons admit that their injections of plasma are in no way anaphylactic and they believe that the plasma is less toxic than the serum and is to be preferred to total blood, whose red blood corpuscles act as foreign bodies. This interpretation is, so far as it goes, exact, but should be extended to heteroplasm, as well as to autoplasm and autoserum, the mere fact of being extracts of the organism making these bodies different from living plasma from the physicochemical viewpoint.

Briefly, what is to be remembered is that intravenous injections of plasma first produce a chill, then headache and hypotension, a rise in temperature, sudation, then a drop in the temperature with general improvement of the patient's general condition of variable duration—sometimes permanent. The observers last mentioned do not seem to have specially considered the leucocytic reaction, but it exists since they regard the reaction observed after injection of plasma as similar to peptonic shock and

hemoclastic crisis, in which the blood undergoes lytic, and afterwards, hematopoietic changes.

Without referring to many other substances, such as sodium nucleinate, quinine, the newer arsenical products, specific sera, etc., and their reactions following intravenous injection, the reactions to which intravenous injections of more or less fine particles of insoluble products give rise will next receive our attention.

It is known that the colloids, Bredig's for example, are heterogenous systems formed by ultra-microscopic particles carrying an electric charge of ionic origin in stable suspension in water, and that when introduced into the veins they produce reactions identical with those already mentioned and in particular, a hematic and leucocytic reaction of high grade. In this respect the pure colloids, stabilized colloids and collobiases—which are not true colloids but suspensions of finely powdered bodies in a gummy colloid—act in exactly the same fashion. Consequently, Audain and Masmonteil could, with perfect propriety, regard the leucogenous action of sugar given intravenously as the same as that of colloidal metals. Nolf compares the reactions of intravenous injections of colloids to peptonic shock, reactions which he attributes—wrongly according to Laumonier—to the presence of stabilizing bodies. Even if these were of peptonic nature, their quantity would be too small to cause any effect from the peptone which exacts, in order to occur, from fifty centigrams to one gram of peptone to each kilogram of the weight of the subject. However, let it be said that the reactions to which the collobiases give rise are usually more severe than those produced by the colloids—stabilized or not—and this difference seems to be due to the inequality of the particles of the collobiases. Nevertheless, the phenomena of reaction are, in all cases, quite alike, whether they are colloids, collobiases, sugar, peptones, sera, or plasma.

Of the work done in the United States with emulsions of dead bacteria by Cowie, Beaven, and others I shall not speak, as you have first hand information on the subject, neither need mention be made of Drinkler and Brittingham's work with transfusion of citrated blood for the like reason. I would point out, however, that Cowie and Beaven give the name of proteinotherapy to their procedure and attribute a large part to proteinic shock—in other words to the effects of peptone. But in the former case the protein is injected in the form of normally insoluble bacterial bodies; nevertheless, both reactions and therapeutic effects are and remain quite the same.

In conclusion, I would refer to the pathogenesis of malarial paroxysms, in the light of recent studies made by Abrami and Senevet. These observers have shown that the malarial paroxysm is the consequence of a hemoclastic shock identical with that resulting from the sudden intravenous introduction of any foreign matter and especially of metallic colloids. In both cases a vasculosanguineous crisis takes place, composed of leucopenia with inversion of the leucocytic formula, rarefaction of the hematoblasts, hypercoagulability of the blood and hypotension, soon followed by chills, then fever, and finally sudation. The satellite symptoms of the paroxysm

—or of a colloidal injection—paleness, nausea, collapse and urticaria, result in reality not from specific intoxication, but from the hemoclastic crisis whose vulgar manifestations it merely expresses, and this crisis occurs under the influence of the sudden inroad of the merozoites at the time when fission of the schizont occurs. This pathogenesis of the malarial paroxysm appears to be quite logical, while clinically there is a perfect similarity between this paroxysm and the colloidal reaction.

No matter what substance is injected into the blood there always follows an identical vasculosanguineous crisis with nervous and febrile manifestations, followed by a hematic and leucocytic reaction, then a return to the normal state. It is a reaction of defense against the sudden introduction of foreign bodies into the blood. This diaphylaxis occurs no matter what foreign body enters the circulation. There is no peptonic, seric or proteinic shock, but simply a hemoclastic crisis common to all, against which the organism reacts always in the same fashion.

Intravenous injections do not always result successfully, first, because the subject may not react because he is worn out by the infectious process from which he is suffering—his diaphylaxis is abolished. Therefore, the intravenous injection is useless. Secondly, certain individuals are either very sensitive or very refractory to such bodies; consequently the reactions are very violent, even fatal at times or else they are *nil*, although the defenses of the organism are not completely inhibited. In these circumstances, experience shows that by changing the nature of the substance injected, better results may be obtained.

PROPER EQUIPMENT FOR A RURAL PHYSICIAN.

By MELVILLE A. HAYS, M. D.,
New York.

Aside from the office furniture (including examining chair or table) which every physician requires, the equipment of a rural physician will depend entirely on whether he is going to rely on his own ability to practice medicine fully and conscientiously, or is going to depend largely on laboratories, specialists, and hospitals (near or remote) for a great deal of assistance; it will also be partly governed by the presence or absence of a reliable drug store where prescriptions may be properly compounded. In the absence of a drug store, the physician will be compelled to carry and dispense his own medicines. These can be secured, largely in tablet form to be dispensed as such or to be made into solutions, from one of the large drug supply houses. The variety of remedies carried and used will depend entirely on the average type of diseases to be treated, and the physician's own views on therapeutics.

If the physician is going to depend for assistance on laboratories, specialists, and hospitals, he will require, aside from necessary medicines, only the ordinary diagnostic instruments (including stethoscope, sphygmomanometer, etc.), a pocket case of

surgical instruments, and a full supply of surgical dressings—gauze, absorbent cotton, bandages, splints, antiseptics, ointments and dusting powders; his serious or puzzling cases will be sent to a specialist or a hospital, and his income will be reduced.

The up to date physician will do most of his own work, and will only refer exceptional or very serious cases to specialists or hospitals. His equipment will necessarily include the following:

Diagnostic.—Stethoscope; standard sphygmomanometer; headlight (electric battery), or mirror, with necessary specula, for examining nose, throat, ears, vagina, and rectum; microscope with necessary slides, cover glasses, and stains; uranalysis outfit with a suitable centrifuge; outfit for Widal reaction and outfit for examining gastric contents; suitable aspirating syringe and needles; materials for special tests for tuberculosis; and other aids as the occasion arises.

Medical.—If there is a reliable drug store near by, the medical equipment will include only hypodermic syringe and needles, with necessary tablets for emergency and other use; in the absence of such drug store, the physician will necessarily be compelled to carry and dispense a full line of therapeutic agencies.

Obstetrical and gynecological.—This will include suitable obstetrical forceps; ether and chloroform; pituitrin in ampoules; ergot; needles, sutures, and ligatures; disinfectant for hands; dilating bag for use in placenta prævia; compact gynecological operating set; vaginal specula; special remedies for local use; and gauze packing strips.

Surgical.—This will include a small portable and compact operating set for general use (similar to the one furnished by the U. S. Army); pocket case for emergencies; needles, sutures, and ligatures; gauze (plain and medicated); bandages (gauze, cotton, and plaster of Paris) and absorbent cotton; splints; antiseptics; special instruments for nose and throat work (tonsillotomes, adenoid currettes, etc.); anesthetics (local and general) and appliances for administering or using them; special hypodermic syringe and needles for administration of mercury preparations in the treatment of syphilis; irrigating appliances for treatment of gonorrhoea; apparatus for administration of salvarsan; apparatus for transfusions; and an aspirating set for general use.

Special.—Spray apparatus (either hand atomizers or compressed air tank) is necessary for the treatment of nose and throat affections. A small optical trial set is another essential which will add to the efficiency and income of the physician; its use may be easily learned. If there is an available supply of electric current, there can be secured and used a cabinet which is supplied with the appliances for diagnostic and therapeutic work, including an x ray outfit. Special work should be sent to a reliable laboratory.

The entire equipment as enumerated will not necessarily be required immediately upon beginning practice, but the essentials should be secured, and the other items added as the occasion arises. Some means of quick transportation, either horse or automobile, is absolutely necessary in all rural practice.

LONDON LETTER.

(From our own correspondent)

The Meeting of the British Medical Association at Cambridge.

LONDON, July 5, 1920.

The last time the British Medical Association met was in the far northern University town of Aberdeen in the fateful year of 1914, shortly before the outbreak of the world war, immediately after the Congress of Surgeons of North America was held in London under the presidency of Dr. J. B. Murphy, of Chicago. I attended that meeting and how well I recall that the air seemed charged with electricity.

The meeting of 1920 took place under very different conditions. In fact, no meeting of this association has been held under more favorable auspices than the eighty-eighth annual meeting. Everything seemed to conspire to render this gathering a conspicuous success. The long interval since the last annual meeting, the ideal place of meeting, Cambridge with its colleges and halls and lecture rooms, only fifty miles from London and a railway centre, and last but not least, the choice as president of Sir Clifford Allbutt, the grand old man of medicine, whose medical scientific knowledge is only equalled by his personal magnetism, his charm of manner, and his gift of oratory. The attendance was large and while fully representative of the British medical profession included also distinguished men from other countries. Dr. Simon Flexner and Dr. Alfred Hess represented research and clinical medicine in New York. Dr. Charles H. Mayo, of Rochester, Minn., and Dr. J. M. T. Finney, of Baltimore, surgery in the United States, and Dr. Brown and others from Johns Hopkins Medical School.

The comfort and entertainment of the visitors were well looked after and there was so much of interest to see in Cambridge that one did not quite know what to see and what not to see. Tours through the colleges were arranged and although Oxford is generally pointed to as offering more in the way of architectural, historical and archeological delectation, yet Cambridge, even if second in this respect, is, at least, a very good second. Indeed Oxford has nothing to show to compare with the wonderful King's College chapel at Cambridge and the quadrangles and hall of Trinity College are certainly not surpassed by those of any Oxford College. Garden parties were held at Downing College, Newton Hall, the Bishop's Palace, Ely, Christ's College, Croxton Park, and Madingley Hall and organ recitals were given by college organists at King's College chapel. Numerous excursions were also available, including one to the Cambridgeshire tuberculosis colony, Papworth Hall, situated about twelve miles from Cambridge. The museums with which Cambridge abounds were, of course, all thrown open.

A congregation for the conferring of honorary degrees was held in the Senate House on June 29th when the degree of LL.D., was conferred upon six distinguished medical men of two con-

tinents. The degree was first conferred upon Sir Clifford Allbutt, K.C.B., M.D., Fellow of Gonville and Cains College, regius professor of physic at Cambridge University. In his oration which, as is always the case, was delivered in Latin, Rev. C. E. Raven, dean of Emmanuel College, referred to Sir Clifford, as one whose wide study, admirable writing, and inspiring zeal had lifted him to a position in which both the medical faculty and the university looked jointly upon him as their own. It may be mentioned that Sir Clifford Allbutt is in his eighty-fourth year. The other recipients of the degree were: M. Jules Bordet, president of the Faculty of Medicine and director of the Institute Pasteur at Brussels; Simon Flexner, director of the laboratories of the Rockefeller Institute for Medical Research, New York; Dr. Piero Giacosa, a professor of materia medica and experimental pharmacology at the University of Turin; Sir George Henry Makins, G.C.M.G., C.B., president of the Royal College of Surgeons, and Sir Norman Moore, Bart., M.D., Honorary Fellow of St. Catherine's College, Cambridge, and president of the Royal College of Physicians. Four gentlemen were unable to attend to receive their degrees, viz., Mr. Albert Calmette, subdirector of the Institute Pasteur of Paris; Dr. Harvey Cushing, professor of surgery at Harvard University, Major General William Crawford Gorgas, and Sir Patrick Manson.

On the evening of June 28th, Sir Clifford Allbutt delivered his address as president of the association. The gold medal of the association was presented to the Bishop of Liverpool, as the father of the late Captain Noel Godfrey Chavasse, V.C., M.C., R.A.M.C., to whom the Victoria Cross was awarded in 1916, for extraordinary acts of bravery.

The Stewart Prize was presented to Miss Harriette Chick, D. Sc., in recognition of her own work and that of the band of scientific women associated with her in the investigations into the means for preventing scurvy and beri beri in armies and among populations suffering privations. The Middlemore Prize was presented to Harry Moss Pragnair, M.D., F.R.C.P., D.P.H., for his essay on perimetry, inclusive of scotometry, its methods, and its value to the ophthalmic surgeon.

After the presidential address the visitors, numbering about one thousand, were received on the grounds of King's College by the Master, Dr. Grove, and members of the Cambridge Huntingdon Branch of the British Medical Association. At 10 p.m. the company assembled in the hall of King's College, where Sir Clifford Allbutt was presented with a large portrait painted by Sir William Orpen. Sir Norman Moore made the presentation in a fitting speech.

The evidence afforded of the trend of medicine of the present day, was the most significant feature of the meeting. Judging from the prominence given to preventive medicine there would seem to be little doubt of what the future of medical practice would be. All the meetings concerned with preventive medicine were largely attended and it

was somewhat curious and in a way disheartening to note that the attitude of the medical men present appeared to be defensive. The medical profession seemed to fear state control. Sir George Newman, in his opening speech in the section in sociology, fully recognized this and endeavored to reassure the profession. While the chief medical adviser to the Ministry of Health undoubtedly meant what he said, he was quite unable to control or perhaps even greatly to influence the situation. As he said, he was after all only a servant, and it was to be feared that politics would rule the situation. It is obvious that the medical profession is impotent politically, while the Labor Party is powerful. Therefore, it is logical to argue that if the Labor Party desires state control of the medical profession they are not unlikely to get it. It is useless to evade probabilities because they are unpleasant and it was of sinister import that the labor representative who spoke at the meeting was wholly in favor of state control.

Another much discussed subject and one that is involved in the question of state control was that of the voluntary hospitals and what is to become of them. The medical profession here as a whole are unalterably opposed to the hospitals passing into the hands of a bureaucracy. Why is it necessary to rely upon the state for the maintenance of hospitals when an obvious way out of the difficulty is ready at hand? Why not introduce a pay system or a modified pay system? It is fair, and should provide sufficient funds to support the hospitals, partially at least. The state or municipalities might aid but there seemed to be no valid reason for the state having complete control. At any rate, the state should pay for insurance patients which, since the passing of the Insurance Act, had placed a great strain upon the resources of hospitals. If everyone paid for hospital treatment according to his or her means it would go a long way toward solving the problem. In the words of Sir Wilmot Herringham, who in discussing the future of the medical profession, dealt with the question from the viewpoint of the consultant, "The only sound remedy, as far as I can see, is to extend to private patients the benefit and convenience of treatment at a hospital. Paying hospitals are one of the greatest needs of the time." Mr. E. W. Morris, who is house governor of the London Hospital, and one of the greatest authorities on the management of hospitals in the world, in the same discussion gave it as his opinion that, considering the enormously increased cost of running the voluntary hospitals, the time had come when patients should as a matter of duty contribute to the cost of their treatment. From all this it will be gathered that the medical profession in Great Britain is in a critical condition. It is at the parting of the ways and it is earnestly hoped that in attempting to avoid the Scylla of unorganized practice it will not be forced into the Charybdis of state control. Sir George Newman said that individualism was the genius of British medical practice and it would be nothing short of a national disaster if that were to be lost or allowed to be destroyed.

Editorial Notes and Comments

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PHYSICIAN AUTHORS — DR. ORLANDO WILLIAMS WIGHT.

A many sided man was Dr. Orlando Williams Wight, author, physician, lecturer, theologian, educator, linguist and traveler—a man who had an interesting and varied career in many lines of endeavor and who was a success in all. Dr. Wight seems to have had some difficulty in making up his mind definitely as to just what course in which to shape his destiny. He began by being an instructor in Eastern academies and when he was only twenty-three years old he became president of the Auburn (N. Y.) Female Academy. Here was a field in which he seemed destined to make a name for himself, but it was not to his liking and so he gave it up and went to New York city, where he began doing free lance work for newspapers and magazines. This was in 1847. At about that period he thought of becoming a minister of the gospel, and so studied theology and was ordained as a Universalist minister, but his religious activities ended there. He never entered the pulpit, but went to Europe in 1853, where he spent several years, renewing his literary work upon his return.

As a physician Dr. Wight was of the late blooming type. He was well along in his middle thirties when he began the study of medicine at the Long Island College Hospital, and was turned forty when he received his degree. He found the practice of medicine more fascinating than any pursuit he had yet attempted and he maintained his connection with it throughout the rest of his life. His first

work as a practicing physician was done at Oconomowoc, Wis., and subsequently in Milwaukee. In 1874 he was appointed surgeon general of Wisconsin and four years later became chief health officer of Milwaukee, in which position he served two years. When the board of health of the city of Detroit was reorganized in 1882 he became the chief health officer there and served until his death six years later.

It would take a five foot shelf with a roomy addition to hold all the volumes of original works and translations that came from Dr. Wight's pen, not counting the volumes he edited and revised, for he was an indefatigable worker. We hear little of him today because he chose literary paths that do not lead to heights of fame. His work was largely translating and he made of it a fine art. But translation is a difficult art and a thankless one, filled with empty honors. To Dr. Wight translation came naturally, for he had a gift for languages. He spoke French, German, Spanish and Italian fluently, and there was none in his time better versed in Latin and Greek than he. He had received a classical education at Westfield Academy and at the Rochester Collegiate Institute and before he had reached his majority was teaching Latin and Greek at Genoa Academy and mathematics and modern languages in Aurora Academy. It was because of his remarkable proficiency as a linguist that Yale University in 1861 conferred on him the degree of A. M. and later the degree of LL. D.

The translations made by Dr. Wight are standard today. They have stood the test of time because they reproduce the spirit and style of their originals; because they were the labor of love of a gifted man who was thoroughly familiar with the manifold complexities of the languages from which and into which he translated. Six volumes of Balzac, Pascal's *Thoughts*, the *Lives and Letters of Abelard and Heloise*, Victor Cousin's *History of Modern Philosophy*, a history of France in several volumes, fourteen volumes of the *Standard French Classics*, the works of Montaigne—these were some of the works translated by Dr. Wight. He also edited and did most of the translating of the *Household Library* in eighteen volumes. This consisted of a series of portraits of the world's most famous historical spirits, the first volume being devoted to Joan of Arc, translated from Jules Michelet's brilliant history of France. Other volumes in the series translated by Dr. Wight included the lives of Peter the Great, Mahomet, Martin Luther, and Socrates.

Dr. Wight had a strong preference for biography and believed that the study of the lives of great men and women made more stimulating and wholesome reading for the American public than what he called "the bloodless personages of mere fiction."

"Life and history," he said, "are always stronger than the day dreams of fancy; they can satisfy the cravings of the imagination while they feed the heart and instruct the mind."

Dr. Wight's own life was written by his brother, Dr. Jarvis Sherman Wight, who was an authority on craniology and author of several medical works, including *Suggestions to Medical Witnesses*. He was for many years professor of surgery and dean of the faculty of Long Island College Hospital, and it was largely through his influence that Dr. Orlando Wight decided to adopt a medical career.

Dr. Wight's contributions to magazines and newspapers would fill half a dozen volumes. His best known medical work was his *Maxims on Public Health*, published in 1884. One of his most successful volumes was his *Lectures on The True, The Beautiful and the Good*. His last book, *A Winding Journey Around The World*, was published the year of his death.

Dr. Wight came of an old colonial family. He was born in Centerville, N. Y., on February 19, 1824, the son of Thomas and Caroline Van Buren Wight, and was a descendant of Thomas Wight who emigrated to the American colonies from the Isle of Wight in the year 1635. He died on October 19, 1888.

VITAMINES IN THE NUTRITION.

Not long ago, A. Lumière, of Lyons, demonstrated that the majority of phenomena which constitute what may be called physiological insolvency can be explained by inanition. It then remained to show what part the want of vitamines played in the inanition. This has been accomplished by Lumière, who recently demonstrated that pigeons fed on decorticated rice—a food deprived of vitamines—ceased to eat after a few days. If the birds were fed by gavage they regurgitated all food given. These phenomena are dependent upon the fact that the alimentary bolus thus constituted is incapable of passing through the pylorus and remains in the upper portion of the digestive tract, especially in the crop, then in the gizzard. When pigeons thus fed are opened it will be found that with a complete alimentation the grains are abundantly impregnated with the secretions, the bolus formed by polished rice being drier. This alimentary bolus is found in the shape of a compact mass in the gizzard, in which gravel is present and in nor-

mal conditions crushes the grains which are as hard as plaster.

In these circumstances, it is evident that digestion cannot be carried out. Quite independent of the mechanical action which causes the food to progress onward in the digestive tract, the aliments ingested should, in the first place, undergo a phase of elaboration, consisting of their dislocation, disaggregation, and hydrolysis in order to give rise to substances whose simplified molecules may be able later to form by synthesis the complex albuminoid matter and other organic combinations which make up the elements of animal tissues. Now, this first act of nutrition can only be assured by the ferments derived from the glands of external secretion whose secretion is completely absent when decorticated rice is used as food.

The consequence of these data—which have been corroborated by the very ingenious experiments of Lumière—is that in the case of decorticated rice the necessary substances for setting up the glandular secretion of the upper digestive tract are lacking and these substances are the very ones called vitamines. Now, if to a pigeon which, following gavage, has reached the phase of intolerance, some drops of oil be given or even a very minute quantity of extract of malt yeast, the glands of external secretion will commence their functions, the alimentary bolus will progress through the digestive tract, and a copious stool will demonstrate that the digestive act has been carried out thoroughly. This is unquestionably a discovery of the utmost import and singularly enlightens the problem of vitamines and physiological insolvency which, until now, has been most obscure.

THE CLINICAL FORMS AND DIAGNOSIS OF ARTHRITIC CELLULITIS.

The clinical forms of cellulitis are numerous and vary according to the region in which the connective tissue is involved. The principal modalities are above all met with in the neuralgic domain. In the upper limb an intercostal pseudoneuralgia will be complained of by the patient, with pain seated in the cutaneous ramuscles which supply the skin of the thoracic walls and extend to the shoulder, arm and lumbar region. That the patient is not suffering from intercostal neuralgia will be made evident by pinching the skin over a nerve filament. This will elicit sharp pain, while compressing the skin over a rib will cause characteristic pain. Next in frequency as a clinical form of cellulitis comes sciatica, in which Valleix's points can be brought into evidence, which are obtained not only by com-

pressing the nerve on the underlying bone but also by pinching the skin over a corresponding area

Beside these neuralgias the trigeminus is the seat of pain when cellulitis is present at the point of emergence of this nerve. The neuralgias of the arm, forearm, and shoulder are frequent and often mistaken for joint disturbances; rheumatoid pain in the neck or shoulders is encountered, especially in women who are insufficiently protected by their clothing. Lumbosacral localization of cellulitis gives rise to neuralgia simulating lumbago and may lead to the erroneous diagnosis of a muscular affection. Cellulitis in the abdominal wall near the right iliac fossa has been known to simulate appendicitis, not only in the female but in males as well. Cellulitis around the joints gives rise to periarthritides characterized by a thickening of the tissues which aid in the protection and support of the joint, as well as general soreness of the joint and muscles.

By its symptomatology, as well as by its etiology, gout, another manifestation of arthritism, shows bonds of relationship to cellulitis. The presclerous edema of the subcutaneous connective tissues may extend to the tissue of the same nature surrounding the veins and produce a periphlebitis, which accompanies and invariably follows phlebitis, but can exist without the latter. It produces a feeling of weight in the lower limbs and abdominal region with cold and warm sensations.

In abdominopelvic cellulitis neuralgias occur which are due to the onset of the process in the connective tissue, although by palpation little can be detected. When the cellulitis becomes more marked, however, a doughy feeling is imparted to the organs in the true pelvis which may lead to a diagnosis of tumor, and should the cellulitis be accompanied by fever a suppurating process may be suspected.

Among all these clinical forms the diagnosis is sometimes a matter of some difficulty at first. The diagnosis of cutaneous cellulitis is not hard to make; the symptoms may not all be present but are very distinct when they exist. As far as cellulitic tumefactions are concerned, the continual change in their size, or even in their localization, makes the diagnosis easy. In subcutaneous cellulitis the exciting of superficial pain will prevent diagnostic confusion, for example pseudoappendicitis or sciatica. The presence of several foci of cellulitis in various parts of the body will also aid in diagnosis. Thus should there be any hesitancy as to whether a tumor or neuralgia is due to cellulitis and another focus is found, for instance in the arm or shoulder, the real condition becomes clear.

THE MIND OF A SURGEON.

Professor J. L. Faure, the distinguished French surgeon, has written a brochure, *L'ame du Chirurgien*, showing the triumphs and difficulties of the surgeon's life. He says: "There is not a man in the world who receives more often than the surgeon the impress of powerful emotions, sometimes pleasant, often tragic and sorrowful, but of an infinite variety and of which perhaps only the diversity permits him to endure without faltering the incessant repetition. In the battles which he fights each day and of which the stake is a human life, he knows one by one the pangs of imminent danger and the satisfaction of difficulty overcome. Abruptly and without transition he passes from the tranquillity of mind resulting from an ordinary operation to the sudden disquietude which springs from some unforeseen accident. His soul is engrossed in these constant struggles and sudden shocks. There is not an act of his professional life which for the surgeon does not entail grave responsibilities. From each of his decisions, each of his thoughts, each of his acts, and sometimes even from his gestures may arise the most fortunate results or the most tragic consequences. It is a grave and serious function, that of the man who each instant holds life or death in his hand, and the rôle of the surgeon is often of singular grandeur."

News Items.

Personal.—Dr. Harry J. Moss, superintendent of the Hebrew Hospital, Baltimore, has been appointed superintendent of the Brownsville and East New York Hospital, Brooklyn.

New York City Acquires Milk Stations.—The Nathan Strauss milk stations and laboratory, established in 1892, were taken over by New York on September 1st. Dr. Royal S. Copeland, health commissioner, accepted the plant on behalf of the city.

Death of Professor Wundt.—Word has been received from Leipsic of the death there on August 31st of Professor Wilhelm Wundt, at the age of eighty-eight. Professor Wundt held the chair of philosophy at Leipsic, where he had founded an institute for experimental psychology.

Southwestern Medical Meeting.—The fifteenth annual meeting of the Medical Association of the Southwest, composed of the States of Missouri, Kansas, Oklahoma, Arkansas and Texas, will be held November 22nd to 24th at Wichita, Kan., under the presidency of Dr. E. E. Day, of Arkansas City, Kan.

New Plan for Poliomyelitis Patients.—The 500 or more children suffering from poliomyelitis who have been receiving treatment three times a week in the clinics of city hospitals in charge of the Department of Public Welfare are to be put under a new plan of treatment. They are to be admitted to resident patients, and a public school teacher will be provided for each hospital. Many of the children have been unable to attend school, and the plan to be followed will prevent neglect of their education.

Red Cross Public Health Chair.—A chair of public health in the University of British Columbia will be endowed by the Provincial Red Cross of Canada, the Red Cross paying the salary of the professor for three years.

Abandoned Base Hospital Burned.—Twenty buildings of the former United States Base Hospital No. 1, now abandoned, in the Bronx, New York City, were destroyed by fire on the night of September 2nd. The damage is estimated at \$20,000.

Cholera in Corea.—A press dispatch from Corea states that there are 9,000 cases of cholera in Corea and that 3,000 deaths are reported there. Corean superstition has added to the difficulties in fighting the epidemic, as the natives conceal the bodies of victims in their homes to prevent cremation.

Increased Birth Rate.—The birth rate for the first seven months of this year is 22.34, as compared with a rate of 21.90 for the corresponding period in 1919, according to statistics of the New York City health department. In addition to this the infant mortality rate for the periods referred to has declined from 92 in 1919 to 83 for the present year.

Army Commissions.—Commissions in the Medical Corps of the regular army have been issued recently. Dr. Attilo M. Caccini, who for the last eighteen months has been engaged in sanitary work at the U. S. aviation camp at Garden City, L. I., was commissioned a major. Dr. William Frank McLaughlin, of Fox Hills General Hospital, Staten Island, received the commission of captain.

Tuberculosis Workshop.—A workshop and training school for the industrial rehabilitation of exservice men, convalescent from tuberculosis in the arrested stage, is being maintained in Long Island City by the Federal Vocational Board, the National Tuberculosis Association, and the New York Tuberculosis Association. As soon as the shop has become self-sustaining others than exservice men will be received.

The shop is incorporated under the name of the Reco Manufacturing Company, Inc., and is located at 458 Pierce avenue, Long Island City, in a large, airy, well lighted loft with lunch room and other conveniences. Medical care and treatment are at hand in any emergency. The object is to teach gradually and safely a trade that will not be injurious and in which, after the men have learned to make marketable goods, they will be paid the same wages as others doing the same work. An opportunity is thus offered to learn one of the following skilled trades under instruction of experts: Watch repairing, jewelry manufacturing (gold and platinum), or high class cabinet making. As soon as a man learns to make goods that can be sold or repairs that are paid for, he will receive the regular union wage for that particular kind of work. This training does not in itself affect any compensation he may now be receiving from the Government. To apply for admission, men must come in person to the New York Tuberculosis Association, 10 East Thirty-ninth street, New York City (third floor).

Memorial at Jefferson Medical College.—A bronze tablet engraved with the names of twenty-five graduates of Jefferson Medical College, Philadelphia, who lost their lives in the war, will be dedicated on October 7th. The tablet is the gift of the Alumni Association.

New York State Health Conference.—The nineteenth annual conference of sanitary officers and the second annual conference of public health nurses of the state of New York were held September 7th to 9th at Saratoga Springs, N. Y., under the auspices of the State Department of Health.

Railway Surgeons Meet.—The thirtieth annual session of the New York and New England Association of Railway Surgeons will be held Tuesday, October 19th, at the Hotel McAlpin, New York, under the presidency of Dr. William B. Coley, of New York. Among those who will deliver addresses are Dr. Joseph A. Blake, of New York; Dr. George W. Crile, of Cleveland, and Dr. Fred H. Albee, of New York. Clinics will be held at local hospitals on Wednesday and Thursday, October 20th and 21st.

Viennese Physicians in Need of Aid.—An appeal has been received from the American Relief Committee for Sufferers in Austria, of which Frederic Courtland Penfield, late American ambassador to Austria-Hungary, is honorary chairman, for the relief of destitute Viennese physicians and surgeons. The committee has created a special fund to aid medical men, who must combat an increasing mortality on pitifully inadequate incomes. Contributions may be made to Alvin W. Krech, president, Equitable Trust Company, 37 Wall street, New York, treasurer of the committee.

Died.

BEUKERS.—In Berkeley, Cal., on Monday, August 16th, Dr. Joseph M. Beukers, aged sixty-five years.

BOOKER.—In Selma, Cal., on Saturday, August 21st, Dr. Thomas Alvin Booker, aged forty-eight years.

BRADNER.—In New York, on Tuesday, August 31st, Dr. Frederick Clark Bradner, aged forty-seven years.

CALDERON.—In San Francisco, Cal., on Wednesday, August 25th, Dr. Eustorjio Calderon, aged fifty-nine years.

FOLLETT.—In Machias, N. Y., on Sunday, August 29th, Dr. William Follett, aged forty-nine years.

HAYES.—In Lock Haven, Pa., on Wednesday, August 25th, Dr. Joseph Henry Hayes, aged seventy-nine years.

LOWRIGHT.—In Allentown Pa., on Saturday, July 24th, Dr. James Harvey Lowright, of Center Valley, aged sixty-two years.

NILES.—In Marshall, Mich., Dr. William Holyoke Niles, aged thirty-five years.

PHELAN.—In San Jose, Cal., on Monday, August 9th, Dr. Daniel J. Phelan, of New York.

SHIMER.—In Easton, Pa., on Monday, August 23rd, Dr. Sterling Shimer, aged fifty years.

STUCKMEYER.—In Indianapolis, Ind., on Sunday, August 22nd, Dr. William E. Stuckmeyer, aged thirty-eight years.

TERRY.—In Providence, R. I., on Tuesday, August 24th, Dr. Herbert Terry, aged sixty-six years.

YODER.—In Catasauqua, Pa., on Tuesday, August 24th, Dr. Daniel Yoder, aged eighty-seven years.

Book Reviews

PSYCHOANALYSIS.

An Outline of Psychoanalysis. By BARBARA LOW, B. A., Member of the British Psychoanalytical Society, Formerly Training College Lecturer. Introduction by ERNEST JONES, M. D., M. R. C. P. (London), President of the British Psychoanalytical Society, etc. New York: Harcourt, Brace and Howe, 1920. Pp. v-199.

From a critical point of view it would not be difficult to find minor faults in this exposition of psychoanalysis, but in spite of the annoyance of frequent italics and more frequent capitalization, which are, no doubt, intended to emphasize more important words and passages, the book is well worth reading. Its purpose is to present to the reader a résumé of a comparatively new science—a science more far-reaching in its scope than any which man has heretofore attempted to study, and the work is given in a spirit of profound sincerity. Many new discoveries have been made. The entire old line psychology has been relegated to limbo, though they still teach the old psychology in schools and colleges. Many old pedagogues, fearful of being disturbed, do not venture into new fields. The unconscious mind is a vast newly discovered territory for which psychoanalysis presents a method of exploring. No more and no less. New valuations are frequently evolved from facing the conditions discovered. In a none too startling fashion Barbara Low has presented this fairly.

With the science in its early growth it is a bit early to set down concretely all its salient points. There is so much to say, so many new words to explain, and it is necessary to understand them all. Many surprising discoveries have been unearthed by the application of analysis. These are so diverse from what we have been in the habit of regarding as the behavior of the human mental mechanism that we are prone at first glance to reject them as absurd. The underlying motives of many of our everyday actions are explained and so frequently are our protective coverings torn away that we instinctively seek for shelter, resulting in the development of resistances. The very mainsprings of existence are tapped, matters of sex are brought to light, and an explanation is given for the repressions which surround us at every turn.

Barbara Low tells us that Freud in making use of various clinical material discovered the workings of the unconscious. He showed how certain emotional contents were rejected by the conscious mind and suppressed into the unconscious, which were then only revealed to the conscious mind in an acceptable form. One of the most common forms of disguising the unresolved complexes which had accumulated in the unconscious was by the use of the symbol. During sleep when the censor was relaxed these suppressed wishes were woven into dreams in which the symbol and other protective mechanisms were employed. Sex was one of the earliest things pushed back into the unconscious and therefore one of the most commonly disguised by the symbol. Sex also played the most prominent part in the unraveling of the unconscious, for there was so little place allowed for it

in the conscious existence in an undisguised form.

Much credit is given Dr. Ernest Jones for the work he has done in analysis in England. If it is made to appear that he has discovered some of the points to which reference is made in connection with his work, we must take into consideration the enthusiasm of the worker who has found so much inspiration in working with him. After all it matters little to whom credit is given. The source is not of primary importance. The vital thing is to understand the great forces which are constantly at work within ourselves and to apply the knowledge gained. To get full benefit from analysis, as Barbara Low points out, it does not suffice to get a cursory intellectual grasp of the underlying principles; it is necessary to plumb to the depths and reach the ultimate emotional level. Then we shall get down to true values.

She also shows how analysis can be applied to numberless fields of human endeavor; to the understanding of self, to the understanding of the urges which drive us on. She shows how far-reaching it can be made when applied socially, in teaching, and in an understanding of the new interpretation of the things that are studied. She shows how important a place in the social group the teacher has, how he may by his rigorous behavior in the class room create a twisted father complex or how by punishment create a sex sadistic complex. These are only a few points that have been brought out in this small book and many of the more vital ones in analysis have hardly been touched. On the whole, considering the condensation that was required, a great deal of territory has been covered and an understanding portrayal of the elements of psychoanalysis presented.

THE PROBLEM OF TUBERCULOSIS.

Tuberculosis and Public Health. By H. HYSLOP THOMSON, M. D., D. P. H.; County Medical Officer of Health, County Tuberculosis Officer, and School Medical Officer for Hertfordshire; Formerly Tuberculosis Officer for Newport and East Monmouthshire, etc. New York and London: Longmans, Green & Co., 1920. Pp. xi-104.

With laboring breath and halting steps, the thousands of tuberculous in England had faced the road which leads to cure, and the great wave of health they met was encouraging others to set out. The death rate was diminishing when war and progress met. In 1914 the number of deaths had gone down from 53,120 to 50,298; in 1918 it had risen to 58,073. The war emphasized the relationship between a deficient food supply and tuberculosis and showed that a diet rich in fats and vitamins is essential to protect the human body. Today the fight is renewed, heavily handicapped by the scarcity of food and housing, though often it is the nonhygienic habits of the householders which do the mischief. The mid-Victorian ideas of the viciousness of fresh air, especially at night, still prevail. Moreover, the construction of cities from a health point of view has never been considered, still less has any attention been paid to the question of housing for the tuberculous. But nothing will

be done effectually without the intelligent cooperation of the people. There must be amplification of the present system of notification; fats and sugars must be sold at reasonable prices; there must be abolition of insanitary areas, segregation of advanced cases, and the provision of a clean milk supply. All these seem simple weapons to fight so powerful an enemy, but none more effectual have yet been discovered. The modern tendency to provide hospital, sanatorium, and colony in one has proved the best. A large and suitable site and much expenditure are necessary, but the preventive treatment of advanced cases, the conservative treatment of quiescent ones, and the improvement of the economic standard of the patient are now maintained. As the type of common adult pulmonary consumption is rarely met with in children under fifteen, the usual form being latent tuberculosis of bovine origin, a special block or place should be provided for these.

Considered economically, tuberculosis is a great cause of poverty, and to complete the vicious circle, poverty is a great cause of tuberculosis, therefore all schemes for relief should have governmental and official support. The disease is a cause of death when life should be at its strongest, and the annual loss is estimated at many million pounds.

Even after apparent return to normal working health, the questions come swarming as to how that health shall be kept. Various other points are considered and ably treated by one who has wrestled with the problems in many responsible positions.

THE COLLOIDS.

The Use of Colloids in Health and Disease. By ALFRED B. SEARLE. With Foreword by Sir MALCOLM MORRIS, E. C. V. O. Illustrated. London: Constable & Co., Ltd., 1920; New York: E. P. Dutton & Company. Pp. vii-120.

Thomas Graham in 1861 added another perplexity to the medical sciences. His discovery that certain solutions would pass through a membrane and others not, threw light upon a state of matter of which little or nothing was known at the time, though so much in life and the commercial world depended on it. He gave the name colloidal (Kollagel) to that state in which substances may show characteristics in solution quite different from those of a true solution. These solutions he named sols. There are no groups of substances invariably colloid. Soaps dissolving in alcohol are correctly termed crystalloids. In water they behave equally characteristically as colloids. There are organic substances between the two which are called semicolloids. Each true colloidal particle carries a definite charge of electricity, some being electro-positive, other electronegative.

The difficulties of research seem endless, but the part to be played by colloidal sols and gels in hygiene is realized. Chadwick firmly believed that the entire removal of all conditions of dirt, including foul air and bad drainage, was an effectual preventive of all forms of epidemic, and here Mr. Searle goes aside to describe the peculiar behavior of soap, due to its colloidal character. He also frankly points out where the colloids hitherto have failed as germicides and disinfectants, but gives the hopeful views born of recent studies. The chapters on the uses

of colloidal remedies, with authentic cases of cure given by men like Sir James Cantlie and Sir Malcolm Morris, who found that colloidal silver had a distinctly soothing effect while curing perineal eczema, hemorrhoids, and enlarged prostate with irritation of the bladder, also contain much about colloidal mercury, iron, antimony, and manganese.

In conclusion it is urged that the colloids used by physicians should be prepared with the greatest care, for preparations good enough for the chemical lectures are usually too unstable for medical purposes. Also a small number of recent writers have confused colloidal elements and complex organic compounds which may be used either in a colloidal state or as a true solution. The condemnatory statements have usually been made by those with an imperfect knowledge of colloids, or relate to those nonisotonic with serum and other body fluids.

The author is surely justified in his plea that the discovery of artificially prepared colloids which are stable when in the human organism is so recent, yet the results after administration so interesting that they merit a clear setting forth, for the learned to become more learned and the unconverted more confounded and unable to answer.

WOMAN.

Woman. By MAGDELEINE MARX. Introduction by HENRI BARBUSSE. Translated by ADELE SZOLD SELTZER. New York: Thomas Seltzer, 1920. Pp. vii-228.

It is not possible to subscribe unqualifiedly to the extravagant praise which the introduction bestows upon this book. It is true that it has various poetic qualities which give the author a certain literary rank. It has truth, the fearless expression of the new attitudes, the untrammelled convictions of a young soul who must find life for herself. She must do more than this; she must live that life apart from the conventional molds to which it may attach itself even by its own choice. So in accepting the various experiences of womanhood, independence of parents, earning of livelihood, marriage, motherhood, even a second love, she strives for an independence which is the finding and the assertion of the need to live out her own inner self. There are other poetic marks, charm of style, the grace of enticing the moods of wind and weather to express the play and the cry of human feeling.

Yet when these things are appreciated there is a bitter flavor underneath, a slightly sour morbidity, one might say, which demands deeper probing. The woman, fictitious character though she may be, spends too much force upon self inspection. She might say she escaped morbidity because of her appraisal of all this self in terms of living and of loving widely. Yet there is an insistent note of narcissism, too much reference of it all to herself and in terms of herself. Her love, toward her male objects, her child, the friend of her own sex, turns upon itself for measurement and for definition, not toward the loss of itself in an extraneous outpouring. Superficially the book seems to reveal a high unselfishness which reaches out more truly than narrow conventions would allow. The rule of measurement, however, remains behind even in the beautiful body which fills the horizon rather

than forms only a stimulus to wider things. This is the reason why, when a new love intruded upon the old and took possession both of soul and body, it was counted justified. The more ancient experience of woman in giving herself to the free enjoyment of any claims upon her presented itself as this woman's right and her extravagant absorption in self obscured the reversionary character of this promiscuity. Her need to take as freely of love as of sun and air seemed to efface another need that belongs to progress, that of bending the rights of the individual to a restriction which has for its end a different broadening out beyond self.

The book does not speak entirely of such blind absorption in one's own need. It does represent the awakening of woman to greater sincerity with herself in her relation to life and love. It reveals the effort to obtain greater understanding and freer exercise of one's powers. It reveals, however, those inner psychic factors which emotionally forge chains about the self. For this reason the poetry is too self-indulgent and it becomes self-deceptive. It is true that the way out has to be learned first through a genuine valuation of soul and body which has been in danger of being forgotten, but one is tempted to remain only at this valuation. The franker literature of the present day, in which this more fearless evaluation of self is found, must nevertheless fix its eye upon a higher end. It must not begin and end with I and my.

THE SUPERSTITION OF CHESTERTON

The Superstition of Divorce. By G. K. CHESTERTON, Author of *Heretics*, *Orthodoxy*, etc. New York: John Lane Company, 1920. Pp. 11-150.

The controversy over the proposed changes in the divorce law in England has brought Mr. Chesterton rushing to the defense of the *status quo*. He comes, like the White Knight, equipped with all manner of fantastic and useless apparatus—puns, prejudices, paradoxes, anecdotes, epigrams, inconsistencies, and with a professed determination not to employ the "religious argument." Literally, he does not, but actually he speaks from the ecclesiastical viewpoint.

Mr. Chesterton does not believe in divorce because he does not believe in remarriage. Marriage, he says, is a vow, like poverty or chastity; it is "the idea of loyalty"; it is "a tryst with oneself." The tragedy of unsuited people he admits with a certain sadistic satisfaction; it is a "noble and fruitful tragedy, like that of a man who falls fighting for his country, or dies testifying to the truth." These arguments reveal Mr. Chesterton's mind—a mind occupied with the tenuous concepts of theological ethics and preferring noble attitudes to reality. For the whole conception of vows is a superstition, the superstition of an ancient theology which opposed the facts of human nature with an implacable idea. Man was ill at ease in the days of the church fathers, he was only in inconsiderable degree the master of his environment, and because he felt little and uncomfortable he bolstered up his courage with grandiose conceptions. Mr. Chesterton, of course, is only one of the many who still hold these conceptions, but in his case is found the *reductio ad absurdum*. No doubt he views the "tryst with oneself" and the gall-

ery of unsuited martyrs as an indication of the triumph of spirit over flesh. Perhaps, but too often that is a negation of joy and healthful love of living. And martyrdom is not a thing to be encouraged.

Mr. Chesterton was born some centuries too late. He should have been a fat, jolly friar of medieval times, penning polemics on the doctrine of original sin of debating how many angels could stand on the point of a needle. Such a contribution from him would be exceedingly interesting. But in the twentieth century he is ill at ease. Our "worthless, poisonous plutocratic modern society" does not please him and so he tilts at it like Don Quixote at the windmill—his weapon a paradox.

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

THREE YEARS OF WORK FOR HANDICAPPED MEN. A Report of the Activities of the Institute for Crippled and Disabled Men. By JOHN CULBERT FARIES, Ph.D. New York: 1920. Pp. 3-95.

ENOPHTHALMIC GOITRE AND ITS NONSURGICAL TREATMENT. By ISRAEL BRAM, M.D., Instructor in Clinical Medicine, Jefferson Medical College, Philadelphia, etc. St. Louis: C. V. Mosby Company, 1920. Pp. ix-438.

THE FUNDAMENTALS OF HUMAN ANATOMY. Including Its Borderland Districts. From the Viewpoint of a Practitioner. By MARSH FITZMAN, A. B., M. D., Professor of Anatomy in the Dental Department of Washington University, St. Louis. Illustrated. St. Louis: C. V. Mosby Company, 1920. Pp. iii-356.

THE INDUSTRIAL CLINIC. A Handbook Dealing with Health in Work. By Several Writers. Edited by EDGAR L. COLLIS, M. D. (Oxon.), M. R. C. P., Talbot Professor of Preventive Medicine in the University of Wales; Late Director of Welfare and Health, Ministry of Munitions, and H. M. Medical Inspector of Factories. Modern Clinic Manuals. New York: William Wood & Co., 1920. Pp. xii-239.

DIAGNOSTIC METHODS. Chemical, Bacteriological, and Microscopical. A Textbook for Students and Practitioners. By RALPH W. WEBSTER, M. D., Ph. D., Assistant Professor of Pharmacological Therapeutics and Instructor in Medicine in Rush Medical College, University of Chicago; Director of Chicago Laboratory, etc. Sixth Edition, Revised and Enlarged. Illustrated. Philadelphia: P. Blakiston's Son & Co. Pp. xxxix-844.

MENTAL DEFICIENCY. (Amentia.) By A. F. TREGGOLD, M. D., F. R. S. (Edin.), Fellow of the Royal Society of Medicine; Consulting Physician to the National Association for the Feeble Minded; Consulting Mental Specialist to the Willesden Education Authority; Vice-President, Central Association for the Mentally Defective, etc. Third Edition, Revised and Enlarged. Illustrated. New York: William Wood & Co., 1920. Pp. xx-531.

AN ATLAS OF THE PRIMARY AND CUTANEOUS LESIONS OF ACQUIRED SYPHILIS IN THE MALE. By CHARLES F. WHITE, O. B. E., M. C., Major, Royal Army Medical Corps; Lecturer on Venereal Disease and Officer in Charge, Rochester Row Military Hospital; and W. HERBERT BROWN, M. D., Physician for Diseases of the Skin, Victoria Infirmary, Glasgow; Late Captain, Royal Army Medical Corps (T. C.). With a Foreword by Lieutenant General SIR T. H. J. C. GOODWIN, K. C. B., C. M. G., D. S. P., K. H. P., Director General, Army Medical Service. New York: William Wood & Co., 1920. Pp. vii-32.

Miscellany from Home and Foreign Journals

Causes and Definition of Cancer.—Leo Loeb (*American Journal of the Medical Sciences*, June, 1920) discusses the following factors that may enter as causes of cancer: External stimulation of a mechanical or chemical nature; internal chemical stimulation, especially through the action of internal secretion; heredity, which includes various not yet well defined factors, some of them probably identical with other causes; embryonal character of tissue or disturbances of embryonal development, including parthenogenetic development of the ovum; in an indirect way age; contact between normal and cancerous tissue; a possible effect of microorganisms. Cancer is abnormality of growth. Primarily it is a disturbance in the equilibrium of the individual, not through toxins but through an increased proliferative activity of the cells which is usually associated with an increased motility. This increase is long continued and often permanent. It is in all probability in the large majority of cases due to changes in cell metabolism which are of such a character that they propagate themselves. In some cases the same effect may perhaps be produced through extraneous causes, such as microorganisms.

Malignancy in Diseases of the Gallbladder.—J. F. Erdmann (*American Journal of Obstetrics*, December, 1919), among 224 cases subjected to operation for cholecystitis, found the gallbladder malignant in fifteen, or 6.7 per cent. All these cases were in females. In the report of the New York City Board of Health for 1918, nearly ten per cent. of the 2,170 deaths from cancer were instances of cancer of the liver or gallbladder. The frequency of cancer of the biliary system shows the following order: Gallbladder, cystic duct, and liver; pancreas, with common duct contiguity; common hepatic ducts; papilla of Vater. In all the author's victims of gallbladder carcinoma stones were found in the organ. Gallstones or biliary sand evidently act as a provocative factor in the production of malignancy. The statistical aspect of malignancy, as compared with the operative mortality, should be clearly placed before all patients with gallbladder disease. The mortality of cholecystostomy and cholecystectomy is well under four per cent.; in fact, below three and even two per cent. in the hands of experienced clinicians; and if it is recognized that the malignant incidence is between four and six per cent., the patient selecting the operative risk plainly has the advantage of avoiding a malignant death by two to three per cent. No definite symptoms of malignancy can be described in the early onset of the disease. When the gallbladder or mass in the right hypochondriac region becomes palpable in nonacute cases, with or without an ever deepening jaundice, malignancy must be given weighty consideration. Increasing jaundice, slow or insidious, is pathognomonic. Loss of weight is evident only when the tumor extends to the common duct, pancreas, or adjacent viscera. Many patients with gallbladder malignancy mention pain as the first

symptom. Removal of stones in these cases, without complete cholecystectomy, is prone to be followed by a rapidly fatal issue. A satisfactory cholecystectomy can be done in certain cases of involvement of the fundus and body of the gallbladder. These are the cases detected, as a rule incidentally to an operation for cholecystitis. Excision of sections of the common and hepatic ducts may be attempted but resection of the head of the pancreas is attended with undue risk. Involvement of the papilla and ampulla is best overcome by a cystogastrostomy.

Intussusception from Benign Tumor of the Intestines.—A. Murat Willis (*Surgery, Gynecology, and Obstetrics*, June, 1920) emphasizes the following points in intussusception resulting from benign tumor of the intestine:

1. The possibility, or indeed, the probability exists that benign tumors of the small intestine are of more frequent occurrence than the number of cases reported from surgical clinics would lead one to suspect.

2. There is no reason to believe that the material from the Boston institutions is unique and that Bostonians suffer from benign intestinal tumor more than persons in other localities. Accepting this, we face the striking fact that approximately one subject in every 1,500 coming to autopsy shows the presence of adenoma of the small intestine. Even more striking is the fact that in the 7,492 autopsies, benign tumors of the small intestine were encountered nineteen times, so that we have an incidence of nearly one to every 400 autopsies.

3. In considering the few cases of adenoma that have been reported by surgeons, it must be remembered that many of the so-called polyps are adenomatous in structure, but cannot be included because of the failure to make a histological examination of the tumor.

Acquired Immunity in Recent Grippe Epidemics.—Chauffard (*Bulletin de l'Académie de médecine*, April 27, 1920) refers to a theory recently advanced by P. Jacquet to the effect that whereas true epidemic influenza, such as that of 1918, confers actual immunity, the more common seasonal disorder generally labelled grippe is a nonimmunizing affection. Chauffard presents statistics on forty cases, comprising twenty-two men and eighteen women who developed grippe between October 13, 1919, and March 29, 1920. The eighteen cases in women were of a more or less severe thoracic type, ranging from diffuse bronchitis to instances of congestive or bronchopneumonic areas in the lungs. Of the twenty-two cases in men, fifteen were likewise instances of thoracic grippe, while seven were cases of milder, uncomplicated grippe. Out of the entire series of forty, eleven, or 27.5 per cent., had had an attack of influenza during the epidemic of 1918-1919. These eleven comprised eight men, or thirty-six per cent., with a history of influenza, and three women, or 16.6 per cent. Five of the eleven original attacks had

consisted of more or less severe thoracic grippe and six of mild, uncomplicated grippe. In no case, apparently, had the attack been one of typical febrile influenza with nervous manifestations. In view of the enormous number of persons afflicted in the great epidemic of 1918-1919 it seems remarkable that nearly three fourths of the more recent cases should have occurred in persons unaffected in the former epidemic. This ratio is of some significance as indirect proof of an immunizing action of epidemic influenza. The fact that none of the forty recent cases gave a history of nervous febrile influenza tends to show that, among the complex forms in which epidemic influenza occurs, the most specific and probably the most immunizing form is the nervous febrile variety which marks the beginning of great pandemics and runs its course without secondary infectious complications. Recognition of the immunizing property of influenza introduces the possibility of preventive vaccination against the disease.

Complement Fixation in Influenza.—H. J. B. Fry and C. Lundie (*Lancet*, February 14, 1920) carried out a rather small but carefully controlled series of experiments on complement fixation in influenza, using the sera of patients in a venereal hospital for investigation. The antigen used was prepared from an organism isolated from a blood culture made during the third wave of the epidemic. Control sera from normal individuals, syphilitics, patients with typhoid, malaria, and tuberculosis, and from patients with pyrexia of unknown origin were utilized. The results are summarized as follows:

1. The antigen shows greater or less fixation of complement with sera derived from cases of influenza, both recent and those occurring in previous waves of the epidemic.

2. This complement fixation is absent from the sera of normal individuals who have never had influenza.

3. It is absent in the case of sera from individuals who are suffering from other specific diseases and are free from any recent history of influenza.

4. An antigen prepared from a coliform organism, isolated as a contamination from the spinal fluid of an influenza patient, shows no fixation of complement with sera from cases of influenza.

Chest Measurements.—Robert M. Culler (*Military Surgeon*, June, 1920) writes of the futility of recording chest measurements at the nipple line, giving the following reasons for his deductions:

1. Lung capacity and competency cannot be estimated by a tape line nor actual lung disease excluded.

2. The degree of chest expansion or mobility, expressed in inches on reports of physical examinations, are of no value except to suggest developmental possibilities in the immature.

3. The form of the chest in young men is immaterial, since all forms can be increased in size by rib elevation through muscular development. None of the classical chest forms are incompatible with great lung power and physical vigor.

4. If chest mobility is to be recorded by inches, the measurements should be made at the level of the ensiform cartilage.

The Prevention of Respiratory Diseases in Infancy and Early Childhood.—John, Sobel (*Medical Record*, May 15, 1920) remarks that acute bronchitis and bronchopneumonia are the two diseases which cause most deaths in children under five years. In prophylactic measures two main considerations present themselves: 1, The need of placing the throat, nose, mouth and teeth in such condition, through nasal and oral hygiene, that the various bacteria ever present in these localities will find the throat and nose less favorable for either development; 2, that by the avoidance of overeating, overexercise, fatigue, irritability and a lack of the necessary amount of sleep, the general health may be kept at such a standard as to maintain sufficient resistance to ward off diseases of the respiratory tract or to minimize their effects.

Plea for Systemic Research Work in Endocrinology.—J. Aug. Hammar (*Endocrinology*, January-March, 1920) states that direct lesions of endocrine organs occur and frequently a certain clinical syndrome has more or less unanimously been considered to be connected with such lesions of one organ or another. To discern such direct lesions, at least when they are somewhat pronounced, our present knowledge has often proved sufficient. But in connection with exophthalmic goitre, Addison's disease, acromegaly and diabetes occur, formes frustes, in which the want of precision in our present anatomical knowledge is perceptible.

The endocrine organs are closely connected with each other functionally, so that a disturbance in the function of one of these organs involves a disturbance in the function of a larger or smaller number of the others. Whether this state of things is characteristic only of the endocrine system or whether after more careful research anything of this sort will also be proved for other organs of the body is another question. It is sufficient to establish that in such cases we must reckon not only with direct but also with indirect disturbances of the endocrine organs.

Mental and Nervous States and Military Efficiency.—Karl M. Bowman (*Military Surgeon*, June, 1920) discusses the relation of defective mental and nervous states to military efficiency, and states that there are in the United States a large number of cases of mental or nervous disease or defect. This is shown by the fact that, out of every twenty men rejected in the draft, one man was rejected for mental defect and one man for mental or nervous disease. During the war every army had large numbers of cases of mental or nervous disease which markedly impaired the efficiency of the fighting forces. To secure the most efficient army possible, it is necessary to eliminate the mentally unfit as soon as possible, but to use available cases of mental or nervous disease or defect whenever possible and where best fitted. To eliminate the mental defectives, the best way is to use the group examinations given by the psychologists to recruits. Such an estimate was perfected and used in our own army and is satisfactory. Borderline cases, depending on their mental age, their physique, and disposition, may be fitted for service. The majority of cases

with a history of a psychosis are unfit for military service. Those offering the best prognoses are: manic depressive, and infective, exhaustive psychoses; acute alcoholic conditions, *per se*, are not a bar to service; chronic alcoholic conditions, if pronounced or with paranoid tendencies. Especially should it be guarded against allowing arrested cases of dementia *præcox* and paranoia from entering the service. Every case must be judged on its individual merits and by a trained board of psychiatrists.

Of the psychoneuroses, all extreme cases are unfit for service. Psychasthenia and anxiety neuroses are the worst types; hysteria and neurasthenia are the best. Because of the high intelligence of many psychoneurotics, they are valuable individuals, and should be used, preferably in noncombatant service. The conscientious objector and the malingerer are frequently cases of mental disease, and, if so, should be treated as such; if not, they should be rigidly dealt with. To prevent nervous and mental diseases from occurring, the method used by our army in France is to be commended—and the method of treatment used is as good as has been devised. The public should be educated toward a truer understanding of the war neuroses in an endeavor to prevent their occurrence. In the future our army will be benefited in mental health and efficiency if the general education in the country is raised and English is universally known; if a program of general mental hygiene for the country is adopted; if syphilis is prevented and properly treated, and if a system of universal military service is adopted.

Sigma Test.—Herman Goodman (*American Journal of Syphilis*, July 1920) states that he has been attracted to the term sigma test or sigma reaction, which is coming into use in France and elsewhere as standing for the term complement fixation test for syphilis. The use of the Greek letter sigma Σ has had some popularity instead of the word syphilis, lues, or specific. For exactness in reporting the sigma test, the qualifying words Wassermann, Noguchi, alcoholic antigen, cholesterinized antigen, or others, may be added. As the doctor who receives and studies his serological reports becomes better acquainted with the technical side of the reaction, he insists that the laboratory inform him of the method in use. It certainly would be confusing if some test were reported Wassermann which was based upon principles and technic remote from the original.

The criticism that substituting the sigma for Wassermann would tend to accredit the test with specificity for syphilis can easily be disregarded, as those diseases which react positively and are not syphilitic in nature are infrequent, and those likely to meet with them can keep in mind that frambesia tropica (yaws), leprosy (nodular form), and possible sleeping sickness give the paradoxical positive. Another criticism that has more weight is that it adds another term to our nomenclature and that the older and now well known phrase Wassermann test will endure, even as the word salvarsan has been deeply rooted as standing for the chemotherapeutic arsenic compound which has been given the new American name arsphenamine.

Practical Considerations in the Diagnosis of Peripheral Nerve Injuries, with Special Reference to Compensatory Movements.—Samuel D. Ingham and John H. Arnett (*Journal of Neurology and Psychiatry*, February, 1920) state that in examining the results of a large number of peripheral nerve lesions, the characteristic and classic symptoms will commonly be found; however, a certain number of cases will exhibit unusual phenomena. These atypical cases are the ones that offer the greatest difficulties in neurosurgical diagnosis. It is inadequate simply to learn a list of the classic symptoms as signs of nerve injuries. The fundamental requisites for accurate diagnosis in such cases include a thorough anatomical knowledge, a mastery of the mechanics of joint action and discriminating observation. With the application of these broad principles to neurosurgical diagnosis, the difficulties are minimized and the proper treatment can be confidently instituted.

Toxicity of Phenylacetic Acid.—Carl P. Sherwin and K. Sellars Kennard (*Journal of Biological Chemistry*, December, 1919) find that phenylacetic acid, which is one of the most important putrefaction products of the normal human body, is not nearly as nontoxic as it was believed to be. Experiments on a hen, a dog, a monkey, and twelve adult males showed that where this acid was ingested thirst, nausea, and in the case of the humans, symptoms of poisoning, not unlike those of alcoholic poisoning, were produced. To determine the toxicity of the acid a dog was fed increasing doses until the seventh day, when death occurred. Microscopic examination of the kidney showed that the secreting epithelium of the proximal convoluted tubule was affected and the epithelium of the arched collecting tubule also showed evidence of a destructive action, while the secreting epithelium of the limbs of Henle's loop showed the most involvement. The interstitial tissue of the kidney, the straight collecting tubules, and the endothelium of the blood vessels did not appear to share in the destructive process.

Congenital Absence of the Vagina and Uterus.—W. R. Robinson (*Surgery, Gynecology and Obstetrics*, July, 1920) states that:

1. The diagnosis of absent vagina and uterus, or of vagina alone, can in most cases be made from the clinical history, supplanting at times the physical examination, when the latter is not readily obtainable.

2. Operative measures tending to create a vaginal tract should be undertaken only in individuals who are physically and psychologically women, in the full sense, which this definition implies.

3. In order that the newly constructed vagina should approach the normal as closely as possible it should be lined with a soft, lubricated mucosa, and the employment of an intestinal loop for that purpose, as advocated and executed by Baldwin, is the choice operation.

4. It is my personal belief that it is much safer to start the separation of the tissues interposed between the rectum and the bladder, in order to establish the copulating channel, from above, instead of from below.

Proceedings of National and Local Societies

BRITISH MEDICAL ASSOCIATION.

*Eighty-eighth Annual Meeting, Held June 25, 1920,
at Cambridge, England.*

The President, Sir CLIFFORD ALLBUTT, in the Chair.

President's Address.—The title of Sir CLIFFORD ALLBUTT's presidential address was *The Universities in Medical Research and Practice*. He said that the better class of general practitioner of fifty years ago was rather after the kind of Hippocrates or Paré than of the modern graduate. His university, in the days before great cities, was nature; in his clinical experience he enriched the instruction, half empirical, half dogmatic, of his medical school by the shrewd, observant, selfreliant, resourceful qualities of the naturalist. His science and practice were of the naturalist, not of the biologist. In Sir Clifford's early days a country drive with such a doctor in Yorkshire used to be one of the rewards of the consultant and a bedside talk with him a lesson in quickness of hand and wit, and of instructive inference and prognosis. He was as clever as the modern cardiologist in knowing when to give digitalis and when to withhold it, even if he were content to diagnose a case as "some bedevilment of the liver." His rules of thumb were not without their efficacy and his flair for the issues of disease marvelous. He did not come across much science, and what he did see of it, chiefly in casual *locums*, did not attract him much: for in truth half science was less useful to him than whole craftsmanship. He was a woodland guide, not a geographer; but as Aristotle and Darwin well knew, the woodlander gathers much curious lore.

However, in the march of intellect this comrade, kindly and loyal as he had been, was gone, and his sort of wisdom died with the individual. Who was to come next? The official doctor, or a family physician more intellectual but no less independent? An official doctor would be as alert and as progressive as a country parson whose service was not much kindled by the changes of promotion to an archdeaconry or a bishopric; while to shift an official doctor from place to place would be to cut the inner threads of those intimacies which we were now declaring to be the clews to the detection of diseases at their sources. Yet as things were, the independent practitioner was isolated; even in a town he was apt to make a little orbit for himself, to drift out of intimacy, perhaps into some jealousies with his brethren; he lacked mental incentive, and gradually let slip occasions of scientific reunion and renewal. Indeed he could not readily leave home to attend scientific meetings, so that too often, as Morsant complained, medical men did not think nor express themselves in a statesmanlike way. His time even at home was so broken up that he lost the habit of study. He might leave his hospital school full of ardor and in rapid growth, but in practice his ardor cooled and he dropped into routine; or at any rate such was his peril. And so less and less might the doctor feel himself a member of

a great profession; he might drift out of public affairs, his outlook and his sympathizers might diminish, his work become a trade, and his medical neighbor his opponent.

Again for some years past a few of us had been protesting against the clipping of family practice by official shears to see the subjects of infectious fevers carried into isolation, and the tuberculous and syphilitic disappearing with them. The children were turned over to the school doctor, the parturient women to the new midwife, and so on. What was to be the end of this pollarding of family practice? Were its branches to be scattered about in a wilderness of specialties and the family physician be a mere sweeper up of unconsidered trifles? Panel practice, for some time discredited by its hereditary taint of the club of infamous memory and by the continual dearth of the means of its development, should, if duly provided, expand into a large, honorable, and even universal department of medical work. The terms of engagement were to be more liberal, the clockwork was complete.

But how was the practitioner to rise to higher standards of modern science and skill when no means of investigating disease or making an intimate diagnosis were provided for him? He was well aware that modern methods of medicine depend on such means as x rays, a battery of stains and other cultural and biochemical apparatus; and not only an education in the use of these, but also the time to give to them. What should we think of a regiment of recruits called out to fight the enemy but unprovided with weapons or munitions? If the doctor was near a university, he could get blood tested for morphological elements or for sugar or nitrogen content, excretions analyzed, bacterial examinations and vaccines made, and so forth, but it was imperative that these opportunities, now confined to the few, should be universal. Moreover, if they were to be fruitful, the practitioner must consult personally with the scientist. These plants with their staff must be established in all districts, together with a much larger provision of cottage hospitals. In the United States medical men were banding together in districts for such a development of their private practices. Five or six of them combined to rent a house with consulting rooms for each, a common apartment for minor surgery, and so on. Each member of the alliance—they were not exactly partners—was expected, in addition to his general practice, to take up special work supplementary to the others so that a fair variety of special skill might be available in the house, skill which, if not of high expert value, was yet quite sufficient for ordinary diagnosis and treatment. For this purpose visits of members of special clinics and ordinary holidays were naturally arranged. Patients liked the system; they saw that it was more thorough. Domiciliary visits became fewer, yet there was always one of the group on the spot. The fees were received by a secretary attendant on the separate account of each member,

and after all upkeep expenses were met the surplus was divided according to the credit of each. The individual earnings were higher than on the separate practices. Such were some of the material advantages, the spiritual were the disappearance of petty jealousies in a spirit of comradeship and a larger freedom for scientific and social life and for public service. The patients learned that a due remuneration of medical service was no longer gained by a multiplication of visits nor by profits of dispensing. These ends could no doubt be attained by different methods, but the essential need was the generally accessible laboratory and staff, to be a little academy and place of reunion, possibly a centre for the meeting of the divisions of this association. But one word of caution; this centre must not be municipal, it must be free from all kinds of officialism and kept alive by a small committee of local practitioners in alliance with the Insurance Committee.

Surgical Treatment of Gastric Ulcer.—Sir BERKELEY MOYNIHAN said that the necessity for the surgical treatment of gastric ulcer was a confession that medical treatment had failed. As commonly employed it was doomed to failure. The surgical treatment of a chronic gastric ulcer called for the performance of one of the following operations: gastroenterostomy, excision, gastroenterostomy combined with excision by knife or cautery (Balfour's operation), gastroenterostomy combined with jejunostomy; resection of a part of the body of the stomach (sleeve resection), partial gastrectomy. Moynihan first reviewed and criticized gastroenterostomy and stated that in consequence of his experience he had abandoned gastroenterostomy alone in the treatment of chronic gastric ulcer, because: 1. The results, even when the operation was successful, were not so satisfactory as those which now followed gastrectomy. The morbidity was greater, the return to health slower, a more watchful aftercare was necessary. 2. Some patients returned with the ulcer still open, and a further operation was required. In such cases the ulcer had almost always perforated all the walls of the stomach, and adhesions had occurred to the liver, pancreas or abdominal wall. 3. Some few patients returned with carcinoma of the stomach after so long an interval as to make it probable that the cancerous change had occurred after the operation had been performed. Estimates of this sort were fallacious, for the chronicity of some forms of malignant disease of the stomach was remarkable. He had recently been consulted on account of a return of her symptoms by a patient upon whom four years and seven months ago he performed gastroenterostomy for carcinoma of the lesser curvature of the stomach, causing obstruction; secondary deposits were present in many glands, in the falciform ligament (one of these nodules was removed for microscopical examination and confirmed the diagnosis), and the liver. 4. There was evidence to show that gastric ulcer might develop even after gastroenterostomy had been performed, when the stomach itself was normal. Excision of the ulcer was given a fair trial but for various sound reasons had been abandoned by Moynihan.

Excision with gastroenterostomy had been found to be superior to gastroenterostomy alone. Concerning excision by cautery, Moynihan said Balfour, of Rochester, with that fertility of resource which was one of the characteristics of his fine work, replaced the method of excision of the ulcer by that of its complete destruction by the actual cautery. Balfour's operation had among its many merits that of simplicity. If an ulcer lay upon the lesser curvature or near it, a little nearer the cardia than the pylorus, or down upon the posterior wall, the operation of excision was likely to be difficult. The method of Balfour made the treatment much easier, quicker, and safer and gave far more satisfactory results. Gastroenterostomy combined with jejunostomy was a method which Moynihan had advocated and practised in cases of grave difficulty and the results had been excellent. There were ulcers of the stomach so large, so awkwardly placed and so deeply penetrating the liver or the pancreas, in patients whose general condition was poor, that any operation became serious. Such cases might be unsuitable for Balfour's operation by reason of the size or remoteness of the ulcer, and for the operation of gastrectomy by reason of the extremely feeble condition of the patient, who had perhaps recently suffered from a copious hemorrhage. In all such cases Moynihan performed gastroenterostomy in Y, generally by the anterior route. The operation of resection of a part of the body of the stomach—sleeve resection—was, of course, reserved for those cases in which the ulcer occupied approximately the middle part of the stomach. After resection of a cylindrical portion of the organ the cut ends were united. Advocacy of this operation appeared to be restricted to a few surgeons, and consequently the number of cases performed was relatively small. He practised it on two occasions only, long ago. In both the operation promised well, but one of the patients returned after four years with an hourglass stomach, for which a second operation was necessary. The rôle of the operation was necessarily very limited.

Moynihan contended that the diagnosis of gastric ulcer was often inaccurate and that a host of diseases, organic and functional alike, were called gastric ulcer. Consequently much literature and most of the statistics dealing with the subject of gastric ulcer lacked that foundation of truth which only an accurate diagnosis could afford. In the cases of indisputable gastric ulcer, when the ulcer was demonstrated beyond cavil by a radiological examination or by inspection upon the operation table, a far greater seriousness attached to the disease than to the condition of duodenal ulcer. Operations upon it were more serious, partly by reason of the extent of the operations themselves, but chiefly in consequence of the less robust state of the patients. This on reflection was not so startling as might at first appear, for many of the patients suffering from duodenal ulcer were otherwise of robust strength and splendid health. Moynihan had operated upon international football players, golfers, lacrosse players, and many distinguished athletes, for duodenal ulcer. Such people were not often found among those who suffered from gastric ulcer; though

there were exceptions, the types of stomach found in the two diseases were distinct from one another, as Hurst had shown.

Moynihan leaned to the belief that many of the cases of carcinoma of the stomach with which a surgeon could deal successfully had their origin in a chronic ulcer. That was not the universal view, but the opinion of those that hold it was weighty and well founded. Prompted by all these considerations, he was gradually brought to the view that gastric ulcer was a disease requiring direct and radical treatment and that it was not safe to trust to the direct method of gastroenterostomy, which whether its action was physiological or mechanical, merely produced a condition of things in which healing could more easily take place. As for partial gastrectomy, the operation of his choice, the risk was not great; over a period of ten years it has not been more than 2.5 per cent. All things considered and account being taken of the five years succeeding operation, it was probably a safer and certainly a more immediately satisfactory operation than gastroenterostomy alone. It could not always be practised. The ulcer might be so large and so placed as to make removal a matter of such great technical difficulty that the immediate hazards were unfair to the patient. But as experience grew the number of such cases diminished.

Moynihan said that nowadays he very rarely practised any other operation than partial gastrectomy or gastroenterostomy in Y combined with jejunostomy. He gave the technic of his partial gastrectomy operation for gastric ulcer, and statistics of results as follows: There were in all 835 operations since the year 1909, with twelve deaths, a total mortality of 1.43 per cent. Excluding the cases of jejunal ulcer there were 808 operations or cases of gastric and duodenal ulcers with ten deaths, a mortality of 1.23 per cent. This included all kind of operations; as stated before, his operative mortality with partial gastrectomy was 2.5 per cent.

Dr. CHARLES MAYO, of Rochester, Minn., discussed factors in the etiology, symptomatology, treatment, complications and results of gastric ulcer. He pointed out that gastric ulcer was more common in males than females and that according to statistics of the Rochester Clinic duodenal ulcer was four times more frequent than gastric ulcer. Medical treatment was chiefly dietetic, and duodenal ulcer rarely became malignant. Gastric ulcer was not caused by traumatism, neither was perforation as serious as believed. The best means of diagnosis was by the x ray; by this agency an accurate diagnosis could be made in ninety-five per cent. of cases, differentiating between gastric and duodenal ulcer. Cancer of the stomach rarely occurred with high acidity. Gastric ulcer was potentially malignant. Copious statistics were given and the various forms of operation practised at Rochester were described in detail. Both Moynihan and Mayo emphasized the wisdom of using absorbable sutures for this operation. Mayo, quoting from Hunter of the New York Life Assurance Company, stated that the operative mortality of gastric ulcer was three per cent. over normal while that of duodenal ulcer was less than normal.

Mr. HERBERT PATERSON, of London, referring to the question of whether gastrojejunostomy exerted a physiological action or was solely mechanical, said that as scepticism was the sure precursor of belief the scepticism displayed by some as to the physiological effects of gastrojejunostomy was a sign that they would soon be converted to his way of thinking. Mr. Paterson showed on the screen the physiological effects of this operation. These effects enabled Nature to relieve or cure hyperchlorhydria by her own methods, which were better by far than artificial means. He did not believe that malignancy was grafted upon chronic gastric ulcer, but was of the opinion that when a gastric ulcer developed malignancy, the ulcer was inherently malignant. He said that either malignant disease did not develop on gastric ulcer or gastrojejunostomy was a cure for cancer.

Mr. BURGESS, of Manchester, said the object was to get rid of gastric ulcer by abolishing the pathological basis, namely, the hyperacidity. The effect of the cautery was superficial, but hyperacidity was best cured by gastroenterostomy. However, gastroenterostomy alone was insufficient; the logical combination was excision and gastroenterostomy of which gastroenterostomy was the essential part. The physiological effect of gastroenterostomy had, in his opinion, been proved beyond doubt. He emphasized the importance of aftertreatment.

Mr. CHARLES RYALL said that gastric ulcer was a simple inflammatory process. He was in favor of gastroenterostomy from the physiological point of view. The kind of operation must be in accordance with the conditions found, but he did not believe in laying down the rule that partial gastrectomy must be done in all cases of gastric ulcer. The cautery was dangerous and too much importance was attached to the connection between chronic ulcer and cancer.

Dr. FINNEY said that he had been through the whole gamut of operations and failed in a sufficient number of cases to produce scepticism. Therefore he was never too sure and he thought it is unwise to lay down hard and fast rules for operation. All cases must be judged by the conditions found. Finney also disbelieved in any sure method of diagnosis. He had opened the abdomen and even the stomach and then he did not know whether there was an ulcer.

Mr. BILLINGTON said that Sir Berkeley Moynihan had taught much concerning the surgery of gastric ulcer. In his opinion the site of the ulcer should determine the kind of operation. The depth and penetration of the ulcer were also factors that must be considered. As a rule partial gastrectomy was not worth the risk. He inclined to gastroenterostomy.

Mr. ROWLANDS, of London, did not believe that the x ray could be depended upon for the purpose of diagnosis, and he put down the failures of gastroenterostomy to bad selection of cases and defective operative technic. Gastroenterostomy should not be entered into lightly. Gastroenterostomy exerted physiological effects. Partial gastrectomy was indicated in some cases but in the hands of the ordinary surgeon was a perilous undertaking.

Sir GEORGE MAKINS thought there was little doubt that malignant ulcer did follow simple ulcer of the stomach. Sir Berkeley Moynihan doubted whether any physiological results ensued upon gastroenterostomy. He thought the alleged physiological effects of the operation were nonexistent. Partial gastrectomy cured in the right cases.

Professional Secrecy.—Dr. LANGDON-DOWN, of Hampton Wick, moved that having considered the question of professional secrecy, more particularly with regard to venereal disease, the representative body reiterate the opinion that the medical practitioner should not in any circumstances disclose voluntarily without the patient's consent information which he had obtained from that patient in the exercise of his professional duties. Dr. Langdon-Down held strongly that the medical profession should not deviate from the position it had always taken in the matter, that secrecy should be maintained. There were cases, he said, in which one received from a court of law an order to divulge one's professional confidence. That was a recognized thing. There were also cases in which the professional man would defy the order of the court and take the consequences. If that was done in a sound case the punishment should not, and would not, be unduly severe. There were also cases when the medical man might feel it his duty to divulge a secret received in a professional way in order to prevent the committing of crime. The question was whether we should weaken our rule by satisfying these exceptions. If there was a breach of confidence between the doctor and the public, untold damage would result. We would do well to adhere to our old rule of secrecy, leaving the doctor, in those cases in which there was doubt, to decide whether there was a sufficiently compelling reason for him to break his confidence.

Dr. T. R. Bradshaw, of Liverpool, proposed that the question be referred back to the medical council. He said that they had clear ideas as to what secrecy meant, but it was a different matter to write those ideas down and formulate them. The council, he hoped, would find words upon which the profession could agree. Mr. E. H. SNELL, of Coventry said there certainly was a difference of opinion as to what a medical man should do in the case of syphilis. Some believed that nothing should be disclosed unless the patient consented, while others thought the man who declined to disclose ought to be shot.

Dr. CHRISTINE MORELL, of London, expressed herself as strongly opposed to referring back. She said that if we did not know what we wanted, we could hardly expect the public or state to support us. We were at the parting of the ways on this question. If we had no definite opinions we should be bound by the State and society to divulge practically all we knew about patients. Dr. Bishop Harman, of London, said the question of venereal disease made it necessary that there should be a rule and a clear view as to what medical men should do. The solicitor of the association stated the legal position. He said that so far as the legal profession was concerned, secrecy was not recognized by the law. So far as secrecy in the church was concerned, it was based on sentimental and not on

legal grounds. In America there was an enactment that no doctor should be compelled to disclose any information he might have received in his professional capacity, and in Scotland a court decision was recorded that secrecy was an essential part of the contract between the doctor and the patient. Secrecy had grown up by custom and strong common sense, as regarded solicitors. It appeared to him that they would be aiming at almost the impossible in endeavoring to get an Act of Parliament to establish that if a medical man knew that secrecy was going to cause crime he would be justified in telling. He submitted the following substitute for the resolution: That having further considered the question of professional secrecy from the viewpoint of the medical profession and with special regard to venereal diseases, the representative body reiterated the opinion that the medical practitioner should, not without his patient's consent voluntarily disclose information which he had obtained from such patient in the exercise of his professional duties.

Dr. C. SANDERS, of Stratford, asked whether the resolution meant that as a profession we were to allow a bounder to live and his wife and child to die. Dr. Langdon-Down pointed out that from the nature of the case we had a fluid, elastic and difficult set of circumstances which it was impossible to define in a brief resolution. We wanted to make our position such that in time of difficulty a man should be guided by judgment and common sense. Dr. BISHOP HARMON said that if a man was affected with venereal disease and the doctor held his peace, he would be affecting somebody else. In that case, if he could save persons from death or a life of misery and did not do so and that circumstance became known, would he not be liable to have an action brought against him by the person injured? If anybody took that course he would win hands down. They could not say that in no circumstances would they disclose information. He asked them not to be afraid of being illogical if there were instances which needed it. The resolution as drafted by the solicitor was carried with only two dissenters. Dr. SHEAHAN, of Portsmouth, moved that the medical profession be placed on the same footing, as to professional secrecy, as clergy, barristers, and solicitors. He remarked that the most advanced and civilized peoples in the world were the Americans and Scotch, and the latter, the most careful people in the British Isles, adhered to secrecy, it was only England of the present day that did not. Dr. Sheahan's motion was defeated. Dr. DAIN, of Birmingham, moved that the council be instructed to consider the extent to which and the ways in which the association was prepared to support its members in maintaining professional secrecy. The resolution was carried.

Report on Medical Services.—At the resumed meeting, June 29th, the main discussion was on the interim report on the future provision of medical and allied services, issued by the Medical Consultation Council of the Ministry of Health and containing proposals for the coordination of all medical services, infirmaries, hospitals, dispensaries and the like, thus insuring that the health resources of

the country should be fully exploited by the community without actually being taken over by the State. Dr. Turner moved that the representative body should express a general approval of the report and stated that such a drastic change in the handling of public health could not be forced down in a lump but would come by degrees. On this motion Dr. C. Buttar, of London, moved that the meeting define the general principles contained in the report and that these principles be submitted to the divisions for an expression of opinion. He contended that they were asked for premature approval. Sir James Barr, of Liverpool, made a slashing attack on the scheme. He said we ought to consider what the scheme was going to cost. His estimate was that if it was carried out as it should be the cost in the first five years would be one hundred million pounds a year and in the next ten years one hundred and fifty million a year. He had heard it said that this was an ideal scheme, but an ideal scheme must be practical. If a man wanted to change his residence to the moon he did not consider whether it was ideal or not, he turned it down because it was not practical. This whole business started with Sir Auckland Geddes, who had told Mr. Lloyd George that if he only had a proper scheme there would be no C3 men but all A1. Mr. Lloyd George was credulous enough to believe him. The result was that Mr. Lloyd George began to think how the population could be made A1 and he established the Ministry of Health, which had no more to do with health than the man in the moon. The Local Government Board had done remarkably well. No one could convert C3 men into A1 men by act of Parliament. In his view the State should be engaged not in the treatment but with the prevention of disease. Adenoids was a perfectly preventable disease, pneumonia was also preventable, and chronic disease of the heart was altogether preventable. Dr. Fothergill, of Brighton, warned the medical profession to be careful, as otherwise they would be jockeyed into a scheme as they had been jockeyed into the insurance business.

Lord DAWSON, chairman of the English Consultative Council and a member of the council of the British Medical Association, who is largely responsible for the drafting of the interim report, said the report only pretended to give the broad outlines of the direction in which the medical profession should move. It was time we asked ourselves whether we were going in for individualism or for something of the nature of State action. This scheme might take twenty years to materialize. The medical profession stood higher today than ever before in the estimation of the public, who looked to the profession for guidance as to the form medical practice should take in the future. Many points were raised by delegates, and ultimately it was resolved that the gathering should consider the general principles contained in the report and submit the whole question to the divisions, and that it be considered at a special representative meeting. The report recommended the establishment of primary health centres equipped for services of curative and preventive medicine, to be conducted by the general practitioners of the various districts in

conjunction with an efficient nursing service. A resolution was proposed affirming that the establishment of these centres was the pivotal idea of the changes recommended. Lord Dawson supported the motion. The idea, he said, was that the State would provide the equipment, but this would not alter the relations existing between doctor and patient. It was intended that the centres should be on a part time basis. There had also been favorably considered the attaching to the centres of provision for what might be called the intermediate section of the community as paying patients. A resolution was passed declaring that in order to attain the objects of an ideal system of medical and allied service, it was necessary that the prevention of disease as well as the provision for its treatment should be based on domiciliary medical service, and that general active practitioners should be actively encouraged in the practice of both. Reference was made to the wisdom which had been displayed in the setting up of the Medical Consultative Council to the Ministry of Health, and the conference carried a resolution regarding the council as an important step in an essential organized means whereby the medical profession could exercise its influence on the health policy of the nation.

Unqualified Medical Practitioners.—The question of unqualified medical practitioners was raised by Dr. R. HOPKINS, of Southwest Wales, who moved that steps should be taken in the public interest to bring to the notice of Parliament the injurious effects of unqualified practice in medicine and surgery. During a brief discussion of the subject it was stated that at present in Glasgow fifty unqualified persons were going about vaccinating people. The resolution was agreed to and a promise made that the committee of the association should bring the matter to the notice of the government.

Hospital Service.—Dr. BOLAM, chairman of the Hospitals Committee, submitted the following motion on behalf of the council of the British Medical Association: That for all work for soldiers and sailors, whether discharged or not, for any disease or injuries connected with the war, the medical staff of voluntary hospitals should be adequately remunerated. For the present the remuneration should represent an addition of not less than twenty-five per cent. to the cost of maintenance for inpatients, and not less than twenty-five per cent. of the ascertained cost for outpatients, the additional sum to be placed at the disposal of the medical staff; that in the case of special clinics, the fee payable to the medical practitioner should not be less than the fee payable by the Ministry of Pensions for identical or similar services, viz., £2.2 a session. The Representative Body adopted the following motion: That the Representative Body is of opinion that the suggested remedy for existing financial straits of hospitals, namely, to demand contributions in aid of their maintenance from the patients, fundamentally alters the basis of the relationship hitherto existing between honorary medical staffs and subscribers, and refers the question to the council for consideration and report.

(To be continued)

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Original Communications

HOW MAY THE TUBERCULOUS PATIENT
SECURE AN ARRESTMENT AND AVOID
BECOMING AN INVALID?*

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The systematic campaign against tuberculosis in America is now in the second half of its second decade. It is now time for us to take stock and see if we are accomplishing what we should; for it is only by analyzing facts that we have a basis for future progress. While it would be profitable to discuss the successes and failures of the movement as a whole and to show the great good that has come to mankind in general, as a result of the gospel of fresh air and better living that has been incessantly preached by those interested in the anti-tuberculosis crusade, I shall limit my discussion to one important clinical problem which confronts all who are trying to help those who are afflicted with tuberculosis to regain their health, viz., how can they regain their health and again be useful members of society.

This theme forces the discussion of two questions; first, how to regain health; second, how to remain healthy; and carries with it an imputation that the ultimate results gained from the treatment of tuberculosis are not all they should be.

The case may be stated as follows: 1, Observation of those who are treated for tuberculosis, whether in the home, the dispensary, or the sanatorium, reveals the sad fact that the total percentage of those who secure an arrestment or healing of their processes is disappointingly small; 2, of those who are pronounced arrested or healed the number who relapse is disappointingly large; 3, of those who remain well as far as their tuberculous infection is concerned a disappointingly large number are in a state of invalidism or semiinvalidism which incapacitates them for taking their place in the social and industrial world. Each of these statements deserves full and free discussion, which should be preceded, however, by certain statements regarding tuberculosis, its general characteristics and its curability. Many of the shortcomings in the diagnosis and treatment of tuberculosis depend upon a failure to understand the essential nature of the disease, and the manner in which it affects

the patient; or if understood, a failure to act in the interest of the patient at the proper time.

Tuberculosis is a chronic infectious inflammatory process in which there is a long interval between the time of infection and the clinical manifestation of the disease. While tubercles undergo much the same type of evolution that is noted in a boil on the body surface—implantation followed by induration, necrosis, rupture, and healing—these changes take place extremely slowly, taking weeks, months or years for the cycle instead of a few hours or a few days. Often the stage of necrosis and rupture fails to appear, the process remaining as an induration for a long period and then changing into scar. During this long period there may be a gradual progressive extension of the infection or there may be intermittent extensions. The infection, however, does not become a clinical disease until sufficient toxins have passed out into the blood stream, and, acting through the nerves and endocrine system, interfere with the normal physiological equilibrium of the various organs and structures; or, until the process acting locally on the nerve endings in the areas of inflammation, causes reflex disturbances in physiological equilibrium; or, until it produces some local change which makes its presence known, such as pleurisy, sputum or blood spitting.

It is evident that a disease process which shows such resistance to the healing forces of the body as tuberculosis, offers chances of healing somewhat in proportion to the extent of the infection and the pathological condition of the tubercles; and further, that the chances of the disease spreading are largely in proportion to the degree of pathological activity in the individual tubercles, the danger being much greater in necrotic ruptured tubercles than in those which have reached only the stage of induration. Whereas, limited infiltration prior to the time that the tubercles undergo necrosis offers a fair opportunity for the process to become quiescent, quiescence occurs much less readily when necrosis has occurred and especially when the process is at the same time extensive. Infection is usually present in the individual in a quiescent or semiquiescent condition long before it is recognized. Unfortunately, it may not produce symptoms; or, if present, they may not be recognized; so the disease as met today is often an advanced destructive process.

From the very nature of the case it must be evident that disappointments in results of treatment

* Read before the sixteenth annual meeting of the National Tuberculosis Association, St. Louis, April 22, 23 and 24, 1920.

are unavoidable. 'But if these disappointments are greater than they should be it is our duty to find out why. A study of reports in the literature, particularly those from institutions, shows a wide variation in the number of cases which are discharged as arrested. It also shows wide variation in the character of the patients as to the stage of the disease, and the length and character of treatment carried out.

The fact that practically all patients who manifest their clinical symptoms in adult life have been in stages alternating between activity and arrestment prior to the time that it was recognized clinically, should suggest the possibility of healing in a very large proportion of early clinical cases when the patient's resistance has been first overcome; and, if such a desirable result is not being produced it must be because the methods of treatment available are not sufficient, or because patients are not given or do not take advantage of a treatment which is capable of producing results.

That tuberculosis is not being treated during this early favorable stage is apparent to all who will observe. Sanatoria and dispensaries are filled with advanced cases. Specialists who should be best able of all members of our profession to cope with this disease successfully are spending most of their energy fighting a losing fight with patients far advanced in the disease. While they are often successful yet they might nearly always be successful if only they guided the patient in the early stages of his disease. This has been the tuberculosis specialist's lament for the past quarter of a century. How much longer it shall continue to be, will depend upon the impression which the truths about tuberculosis make upon the profession and upon those who are afflicted.

The tuberculous patient must not be permitted to become a consumptive. It is only a step from the early, limited, apparently innocent process to the advanced, extensive, dangerous one. The early lesion carries with it all of the possibilities of the advanced one; and unless checked, may at any time assume dangerous proportions. That a small infiltration which has scarcely yet made sufficient disturbance in the normal physiological working of the human machine to make its presence known carries with it a threat or a present danger to life, is not easily appreciated by those who are not more than casually interested in this disease. Unfortunately, this confuses most laymen and an all too large number of medical men. What specialist has not had the experience of making an early diagnosis of tuberculosis at a time when a life could be saved, and having it contradicted by some good doctor, and then seeing the same patient after a few months, or sometimes after a few years, go down to death with advanced tuberculosis. The specialist knows that months, and at times, years intervene between different periods of activity in tuberculosis. The patient and the good doctor too often do not know this, but expect active disease to follow at once when the process is sufficiently advanced for a diagnosis to be made; and when it does not, they too often foolishly assume that the diagnosis was in error. I do not desire to be understood as assert-

ing that specialists never err in diagnosis, but they should not err as often as other members of the profession. Infallibility, however, must not be expected.

Unfortunately there is, as yet, no specific cure for tuberculosis, and our success in therapy must depend upon measures which imitate or aid the patient in his own natural defensive methods. We are forced, too, to apply them at a time, as is evidenced by the activity of the process, when, at least temporarily, the body, unaided, has failed to win its fight. The earlier we come to the aid of the patient the more surely can we help him. While it is possibly true that the patient with an advanced lesion has a higher degree of immunity than the one with a smaller one, yet the advanced lesion produces a more serious local injury which cannot be so readily repaired; and a more serious general impairment of function which weakens the general resistance of the patient; and these together make healing difficult or impossible.

It is a selfevident fact that a satisfactory result can be obtained in a large proportion of those afflicted with tuberculosis only in case they receive treatment when the disease is limited in extent, and before severe pathologic changes have taken place. The fact that our agencies for the treatment of tuberculosis are so generally engaged with advanced cases largely defeats the efficacy of the effort and at the same time furnishes a basis for the persistence of the harmful pessimistic psychology which unfortunately has surrounded tuberculosis since the dawn of therapeutic endeavor. While early diagnosis and early intelligent treatment will restore most tuberculous patients to health, the opinion of the success of therapeutic results today is based too largely upon the treatment, often poorly carried out, of advanced cases in which defeat is conceded as sure and positive in a large proportion before it is undertaken. This fact has done much to discredit the treatment of tuberculosis.

While the imputation that the number of tuberculous patients who attain an arrestment of their disease process is disappointingly small is based on fact, it should in no way discourage therapeutic effort. It should, however, spur on all who are interested in the treatment of this disease to increased effort to secure early diagnosis and immediate intelligent treatment. Then and then only can acceptable results be obtained.

The large proportion of relapses among those who have secured an apparently satisfactory result is another disappointment to clinicians as well as to patients. This danger must always be recognized and guarded against in all ways possible. All other factors being equal the danger of relapse is in proportion to the severity of the pathological process; which again emphasizes the importance of early diagnosis and early treatment. Probably the next most important factor which contributes to relapses is inadequate and insufficient treatment. The chronic nature of tuberculosis must always be borne in mind; so must its resistance to the defensive forces of the body. It must further be borne in mind, if the disease has existed for any length of time, that it so injures its host as to reduce his fighting power.

Whether or not an arrestment shall be attained and maintained depends greatly upon the patient's own powers of resistance; a vague expression, to be sure, but one that has come to be understood as meaning the ability of the body cells to functionate in such a manner as to be able to check attempts at multiplication on the part of the bacilli and extensions of the process to new tissues, and to promote tissue generation in the form of scar in the areas of disease. The greater the extent and the more active the process the greater the disturbance in the physiological processes of the body of the host and the longer the time required for the establishment of equilibrium.

While an individual tubercle might pass through all the changes from implantation of bacilli to tubercle formation and conversion into scar in a few weeks' time under circumstances favorable to healing, in a process so extensive as to produce symptoms and cause clinical tuberculosis, even in an early stage, tubercles are massed together in such a manner as to preclude this rapid healing. Instead of weeks, under most favorable circumstances, months are required for a favorable pathological transformation; and, during all this time it is necessary that the patient's fighting power be adequate not only to prevent further growth of bacilli and extension to new tissues but so to encapsulate the bacilli present that further activity is impossible. To this end hygienic working colonies should be provided for those who are financially dependent where patients with arrested disease can work according to their strength after their discharge from sanatoria.

Patients are often unable, for financial or other legitimate reasons, to carry out the necessary régime long enough to secure an arrestment; at other times, they feel so sure of winning that they cannot see the necessity; or they yield to some desire which at the time seems paramount. The physician will be successful in treating tuberculosis just to the extent that, knowing the character of the process and nature's way of overcoming it, he is able to keep up his own interest in the patient and to secure the patient's cooperation for the time necessary for the pathological process to be transformed into scar and the patient's physical, psychological and nervous equilibrium to be restored to normal or as nearly to normal as possible. The length of time required for this is far longer than is usually believed. In early cases this may take two years or more, and in advanced cases the time is proportionately longer. The time also differs in different individuals, and they must be made to understand this. It is natural and usual for each one to feel that his case is one of the most favorable ones and that he will get well in the minimum time; but usually such is not the case.

We must regard the psychology of the patient. With this in mind it is necessary to impress upon him first that tuberculosis heals slowly and second that it is an individual matter, healing faster in one person than in another, both because the disease process differs in different individuals and because the fighting power of patients, including both natural resistance and willingness to cooperate, differs. It should be further impressed upon him that it will be a matter of two or three years or

more before healing will be completed, and that he will have to take extra good care of himself during that time. We have found psychologically as well as from the viewpoint of results, that it is best not to keep the average patient too long under treatment at one time, but to have him at two or more periods. In our early work we noted that relapses which took place usually occurred from three to nine months after the patient left off treatment. We noticed too that there was a relationship between the tendency to relapse and the degree of healing which took place prior to discharge, the stage of the disease, and the faithfulness with which the patient followed the necessary régime. It was then that we saw that it was a duty as well as an absolute necessity that the physician gain the confidence of his patients to such a degree that they would be willing to cooperate long enough to get well. It is now our rule to treat our patients until physical exercise, such as walking from one to ten miles, according to the condition of the patient, produces no toxic symptoms, and until we feel that the chest signs are no longer those of a nature which are likely to reactivate and spread. The patient is then allowed to interrupt treatment, following out a restricted régime with only occasional supervision for a period varying from three to nine months, when he returns for another period of strict guidance. In far advanced cases a second period of rest followed by a third period of strict guidance is adopted. The results of this method, which is fashioned somewhat after the *Etappen methode* of tuberculin treatment followed by Petruschky, has been most satisfactory to both patient and physician. It furnishes an opportunity for applying the healing measures under favorable psychological conditions long enough for arrestment to occur; and in this way reduces relapses to an unavoidable minimum.

The third criticism of the results of treatment that I desire to discuss is that of those who secure and maintain an arrestment of their tuberculous process, a disappointingly large number remain in a state of invalidism or semiinvalidism which makes it impossible for them to take their places in the social and industrial world. Again we must admit the truth of the criticism; and it is our duty to endeavor to find some method of overcoming it.

Several causes for such a state of invalidism are apparent.

1. Many are so seriously injured by the disease that they are invalids before the treatment is instituted; or become so later. This can be overcome to a large extent by earlier diagnosis and earlier treatment.

2. The struggle to regain health, with its attendant sacrifices and disappointments, makes such a psychological impression on the patient that he fears that any exertion physical or mental may lower his resistance and allow the disease to again become active. The length of the struggle, with its consequent deleterious psychic impressions, can be relieved partly by treating the disease early instead of when advanced. Another factor of importance is that of inculcating a positive philosophy into these patients, telling them what they can do instead of

what they cannot do. There are too many don'ts for consumptives and not enough do's; the result of which teaches them to fear all acts which call for more than a minimum of energy.

A very important factor in preventing invalidism is to restore the patient's nervous and psychical equilibrium and his physical vigor and resistance to a high degree before discharging him. This latter must be done after all activity is over when exercise will not be attended by toxemia or other annoying symptoms. I have no patience with the idea of making patients work or allowing them to be up and around, when their disease is active. It is contrary to sense and proves to be the factor which prevents healing in a great number. Toxemia should be eliminated as soon as possible because of its deleterious influence upon the body functions and because of its harmful psychic effect. Strength must be conserved to fight the infection in every way possible. If the patient exercises when the disease is active both of these principles are disregarded. With rest during the period of activity, the time of treatment is shortened; and with graduated exercise, always within the patient's strength and always short of tiring, pursued until the patient has built up a strong physical resistance, the danger of invalidism will be largely overcome, because the resistance is built up under the direct guidance of the physician.

Many do not seem to recognize the value of rest as a therapeutic measure and blame it for making the patient overcautious and producing invalidism. This is unfair. If it produces this result it is because it is incorrectly applied and because other measures such as exercise at the right time and the psychology of the patient are neglected.

As clinicians we must admit the truth of these criticisms; but, on the other hand, we must insist that they are largely remediable. As Dettweiler so aptly suggested many years ago, the cure of tuberculosis is a matter of character and the pocketbook. It is only a comparatively small number of people who, unaided, are able to finance the long treatment necessary for early tuberculosis, let alone that of advanced. It may be further said with equal truth that few people, unaided, possess sufficient strength of character to persist in a régime of selfdenial and selfcontrol long enough to get well of their tuberculosis, either early or late.

Fortunately financial aid is being secured for large numbers through private philanthropy and public recognition of the tuberculous patient's rights. At the same time it will be a long time before such aid will be adequate. It must be remembered, however, that one's resources will go two or three times further in financing the treatment of early tuberculosis than they will in financing advanced tuberculosis; and the chances of making a useful citizen who can take up his or her burden in the home or state are infinitely greater.

Unfortunately character is something which cannot be bought. Fortunately, however, it may exist as well in those not possessed of means as those who are. Whether it shall stand the test and be able to carry the patient through the long course of treatment until an arrestment has been secured

and the patient restored to usefulness will always depend largely on the physician who guides the case; but to a certain degree upon all those who come in contact with the patient. Not only must the physician furnish the proper psychology for the patient, but also for the attendants as well. This is a considerable burden, but one necessary to be assumed.

As the financial burden increases with the time of treatment extended, so do the psychological problems in the handling of the patient. The remedy for both of these difficulties as far as they can be remedied is early diagnosis and immediate intelligent treatment.

The just but unfortunate criticisms herein discussed may all be largely corrected in the following manner:

1. In order to increase the proportion of arrestments and prevent relapse early diagnosis and immediate application of an adequate treatment are essential; and further, such treatment must be continued long enough to afford the patient's defensive forces the opportunity of not only checking the power of the bacilli to grow and multiply but also to repair the damage done to the patient.

2. The patient, if treated early, will not be so prone to become an invalid, because: a. The disease itself has not yet proven so injurious to his anatomical and physiological processes. b. It will not have made so great and so harmful an impression upon him psychologically. c. His struggle for regaining health has been shorter and it has not taxed his finances so heavily nor has it created in him such fear of relapse.

3. If the patient is to go back and become a useful member of society the physician must prepare him for so doing. To this end it is not sufficient to arrest the tuberculous process, but it is equally important to restore his nervous equilibrium and to build up his physical strength so that he can endure work and to arm him with a positive optimistic psychology which will help him to readjust himself to the hostile forces about him.

THE ASTHMA PROBLEM*

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For many years the problem of asthma has been one of the most difficult in medicine. In fact, it is only within the last decade that any marked advance in its solution has taken place. Until this late date the usual attitude toward the asthmatic patient was summed up in the oft quoted remark, "Of course it's a very distressing disease but no-one ever dies from asthma." Cold comfort this for the poor suffering patient who might go from doctor to doctor, from allopathy to homeopathy, to osteopath and chiropractor, always in pursuit of that mythical "friend of a friend of mine who was cured by —," to be met in the end by the remark quoted above. No wonder he finally gave up try-

* Read before the Albany County Medical Society, March 10, 1920.

ing and accepted his fate with what resignation he could, branded as a neuropath by those of us who could do nothing for him, and bearing with his physical ills the half contemptuous pity of those splendid, healthy, normal individuals who were not neurasthenic and had no asthma. And yet at times a ray of hope broke through his cloud of despair. An occasional authenticated case of cure or relief came to his attention. Some asthmatic moves from Maine to Arizona and is free—or else moves from Arizona to Maine. He gives up farming to become a banker, or carries a lucky penny in his pocket, and our patient tries the same scheme with renewed hope, but it doesn't work for him and another fond hope is blasted.

I well remember, in my medical school days at the College of Physicians and Surgeons, Dr. James, professor of medicine, telling us of a colony of asthmatics who could live only around Second Avenue and Thirteenth Street, New York. As soon as they came above Forty-second Street they had an attack. Many tales as strange as this are current and they explain our readiness to dub the asthmatic as a neuropath and our insistency that if he would only get hold of his nerves and make a man of himself he would cease to suffer. With our more recent knowledge how easy it is to explain some of these apparent inconsistencies.

It is time something was done to help these sufferers. There is probably not one of us who has not, at some time, sat near a patient suffering from an acute attack of asthma, suffering with him in his distress and feeling powerless to help, or, worse yet, able to help and not daring to. We all know that the injection of a small dose of morphine will ease the labored breathing and bring comfort to the patient—for a time. We also know that these attacks will come again and again and that the morphine injection will bring less and less relief with a larger and larger dose until finally we have two evils to fight where before there was but one.

The first real step of progress was made when Meltzer (1) brought forth the hypothesis that asthma was an anaphylactic phenomenon. This was in 1910 and succeeding steps have come rapidly until now it is rare to read a medical magazine which does not contain at least one article on asthma or hypersensitiveness.

In 1911 Freeman and Noon (2), in England, published a short article on the treatment of hay fever by injections of pollen extract, which was apparently the first step in the scientific treatment of hypersensitiveness. Their work was soon followed by similar experiments in the United States. Much of the pioneer work in this line in America has been done by Dr. R. A. Cooke, of New York, with whom I have been associated for ten years, and most of the statistics on which this paper is based have been drawn from his case records.

Starting with the asthma associated with hay fever the work has been a steady assault on the asthmas due to hypersensitiveness to other substances until now I think it is fair to estimate that about seventy per cent. of all asthmas (of course in this paper I exclude the so-called cardiac and renal asthmas) may be diagnosed by careful

work, and in this disease the diagnosis, as a rule, is more than half the battle.

DEFINITION AND CLASSIFICATION.

The following definition and classification of asthma, with postulates which must be fulfilled before one may assume the allergic condition of an individual to any substance, are taken from the article on bronchial asthma by Cooke in Tyson's *System of Medicine*.

Definition.—Bronchial asthma is a condition characterized by dyspnea, both inspiratory and expiratory, especially the latter, due to bronchial spasm and edema of the bronchial mucous membrane. It may be acute, subacute or chronic. The term bronchial asthma should be restricted to that condition which is the result of an allergic reaction.

Classification.

- | | | |
|---------------------|--|--|
| 1. Allergic. | a, by inhalation..... | { Animal dander.
Pollens.
Sachets and perfumes. |
| | b, by ingestion..... | { Drugs.
Foods. |
| | c, by absorption from focus | { Bacterial proteins. |
| | d, by subcutaneous or intravenous injection | { Therapeutic sera. |
| | | { Acute bronchitis
Chronic bronchitis and emphysema.
Pulmonary tuberculosis.
Cardiorenal disease.
Thymic enlargement.
Enlarged bronchial glands.
Reflex bronchial spasm. |
| 2. Nonallergic..... | | |

The relative size of the groups under this classification may be judged from the following figures. I had hoped to have a large group of cases covering the work done in 1917, 1918 and 1919 but owing to the short notice on which this paper was written I am only able to give the figures for 1917, a total of 143 cases. Of these, eight were seen but once or twice and are rejected as giving insufficient data for a diagnosis. The 135 remaining cases were divided as follows: Pollen 52, or 38.5 per cent.; mixed 19, or 14 per cent.; animal 12, or 9 per cent.; bacterial 11, or 8 per cent.; food 2, or 1.5 per cent.; undiagnosed 39, or 29 per cent.

A word in regard to this classification. A large number of patients will give skin reactions to two or more substances in different groups, for instance to a pollen, several foods and possibly some animal dander, and yet the only complaint may be asthma occurring with hay fever in September. This is therefore classed as a pollen asthma and not mixed, although giving skin reactions for other substances. The patient is said to be potentially allergic to the other substances but for some reason they do not come in sufficiently close contact with the bronchial mucous membrane to set up a reaction. At any time, however, clinical symptoms may result from such substances and the patient should be warned of that fact when the diagnosis is made.

The two postulates, formulated by Cooke, that must be fulfilled before we may assume that any substance is etiologically important in a case of hypersensitiveness, are as follows:

1. Hypersensitiveness must be demonstrated either by, a, a positive local reaction, cutaneous or ophthalmic, or b, the original allergic manifestation must be artificially reproduced at will on introduction of the substance, either inhaled, ingested or subcutaneously injected.

2. It must be shown that the individual comes in contact in some way with the suspected substance in order to permit it to act as an etiological factor.

DIAGNOSIS, TREATMENT AND PROGNOSIS.

I shall now take up in detail the diagnosis, treatment and prognosis. First and foremost a careful history is essential. This should include the place and time of year of the first attack, if known, and the general course of subsequent attacks. If the asthma is confined to one season of the year, summer or fall or summer and fall, particularly if it occurs with hay fever, it is almost surely a pollen asthma. This premise is strengthened if it occurs in localities where pollen is abundant, as in the country, and is absent or minimized at the seashore, on shipboard, or in localities where pollen is at a minimum. It is well to remember that there is no rag weed in Europe and very little in Canada and northern United States: Hence the asthmatic victim of rag weed pollen will state that he is free in those localities. Grass pollen, which causes hay fever and asthma in May, June and July (in this zone) is present in Europe, Canada and most of the United States. Therefore the patients sensitive to grass pollen will have their hay fever and asthma no matter where they go for relief. In patients with hay fever asthma is likely to develop during a particularly severe attack but they usually suffer only at the height of the season and recover rapidly after the disappearance of the pollen unless a secondary bacterial infection is acquired, of which more will be said later.

The history should also take into consideration animal hypersensitiveness. Many people know that they have such a hypersensitiveness to horses and that proximity brings on an attack of asthma or hay fever, but few realize that cats, dogs, and other domestic animals may be the cause of their trouble. The mere presence of such an animal in the house, continually shedding its epithelium, may cause much discomfort to a hypersensitive patient even if he shuns intimate contact with the animal. An illustration of this is furnished by a lady who knew that she was hypersensitive to cats but had several in the house, avoiding close contact with them. She suffered from asthma but was free at Atlantic City, attributing the freedom to the change in climate. Removal of the cats plus a thorough house cleaning for a week entirely removed the trouble.

It is well to get a careful history of the location of the attacks. A case in point is that of a boy who had lived in Coney Island for nine years without any trouble. He then moved to a new house where he and his parents lived in two rooms. Within a few days he started to have asthma which continued intermittently for two years. He came to New York and spent ten days in a hospital where he was free. The next month at home he had it

continually. A week at a relative's house in the Bronx and he was free. The asthma returned when he went home. The father of the boy wanted to move from Coney Island as "the climate did not agree with him there," but from the history it was apparent that the causative factor in the asthma was inside those two rooms. Careful investigation and testing revealed two pillows stuffed with rabbit hair to which the boy gave marked skin reactions, and removal of those two pillows removed his asthma completely with no further treatment. This of course is an extreme case but it illustrates how valuable a careful history is in tracking down the offending substance.

Practically all asthmatics are bothered by cold, windy days or damp, muggy weather but these factors should be recognized as nonspecific and not as the specific exciting agents. Like epilepsy, the more asthma a patient has, the easier it is to set up an attack, and conversely, if we can remove the main exciting cause and give the patient freedom for some time, mechanical causes will not, of themselves, excite an attack.

It is often possible to get a history of gastrointestinal disturbances preceding or accompanying the asthma and here it is necessary to find out if the patient has noticed any particular articles of diet which may cause trouble. Such a history must, however, be accepted with caution and subject to future confirmation by tests as we have often found patients' own deductions in this matter most erroneous. It is not unusual to be told that certain articles of diet at times give rise to symptoms and at other times can be eaten with impunity. We know that the skin tests with many foods occasionally give us positive results at one time and negative at another, so it is probable that there is some other element which enters into the situation here, constipation, rapid absorption, certain combinations of food, we know not what it is, and thus gives rise to such differences in the action of foods.

The family history should be carefully elicited. It has been shown (3) that hypersensitiveness is probably transmitted as a dominant characteristic according to the Mendelian law. In a series of 621 cases of human allergy it was shown that if both parents were hypersensitive, 67.5 per cent. of the children would exhibit some clinical form of hypersensitiveness (not necessarily the same as either parent) and that this would appear before the fifth year as a rule. If one parent is hypersensitive sixty per cent. of the children will show hypersensitiveness and the height of the curve of incidence will be before the fifteenth year. In those cases with a negative family history the height of the curve was between the twentieth and twenty-fifth year. In 504 cases with satisfactory history there was a positive antecedent, direct or collateral family history in 48.5 per cent., which contrasted strikingly with a positive history of hypersensitiveness of 14.5 per cent. in the antecedents of seventy-six normal controls. It is estimated that hypersensitiveness occurs in about ten per cent. of all people.

After a careful history has been obtained the patient should be tested against substances to which

he may react. The basis of this test is the fact that where any part of the body is hypersensitive to a foreign substance, as the bronchial mucous membrane in asthma, the nose and eyes in hay fever, the skin in urticaria and angioneurotic edema, there is usually a corresponding hypersensitiveness of the skin to such substance. This is not an invariable rule but occurs in the vast majority of cases. The usual way to make such test solutions is to grind up the substance to be tested in salt solution (with a little carbolic acid added as a preservative), alternately freeze and thaw several times and then filter. Such solutions will keep for a long time if placed in a cool atmosphere when not in use and are not easily contaminated, if ordinary precautions are used. Such test solutions are now put out by many commercial drug houses.

The testing is conveniently done in groups—thus the inhalation group consisting of the pollens, animal emanations, sachets and dusts—the foods—the drugs, etc. Of these the inhalation group is the most important. The solution is injected intradermally (not subcutaneously) into the skin on the outer surface of the upper arm, using a one c. c. tuberculin syringe and a fine needle. A separate syringe is, of course, used for each solution. A minute quantity is sufficient, about one fiftieth c. c. which raises the skin in a wheal about one quarter inch in diameter. From eight to thirty of these tests may be done at one sitting providing the patient is not too sensitive. Here I wish to emphasize a word of warning. Where you have reason to believe the patient is very sensitive do only a few tests at a time. If a patient is hypersensitive to three or four different substances, particularly if these are pollens or animal emanations, it is quite possible to excite an attack of asthma or urticaria from these skin tests alone. Therefore a second word of warning—do not perform any of these tests or give any injections without a bottle of epinephrine at hand. If a reaction develops it is easily and safely controlled by a subcutaneous injection of one half to one c. c. of epinephrine repeated every ten or fifteen minutes if necessary. Reactions will occur. After ten years of this work we are still getting reactions at unexpected times due to the unknown hypersusceptibility of some people but with the prompt administration of epinephrine I have yet to see any reaction which was more than a passing discomfort. I have seen many however, which would have been most uncomfortable, if not even dangerous, but for the prompt and sufficient administration of epinephrine. As to the latter, I have never seen any bad effects from an overdose except a nervous, shaky, chilly feeling which passes off in a longer or shorter time. I do not want to overemphasize the dangers of this method of diagnosis and treatment but if you will bear in mind this precaution you will save your patients and yourself a most uncomfortable hour which may come when least expected.

The skin reaction, if positive, will show in from five to fifteen minutes and in an urticarial wheal varying in size from a dime to a silver dollar or larger. The readings commonly employed are, negative (no enlargement of the original wheal);

slight (about the area of a dime); moderate (between slight and marked); and marked (varying in size from a nickel up, with pseudopod formation). There is usually an area of redness about the wheal and, with the marked reactions, almost invariably a sense of itching. The reactions usually begin to fade away after fifteen or twenty minutes but if many tests are done and several are positive the arm may remain red and swollen for twenty-four hours. This is in no sense an infection and the patient should be reassured and told to apply cold cloths to take away the itchy feeling if it is uncomfortable. Where many tests are to be done it is well to alternate the arms and possibly allow a day or two to elapse between tests. Adults rarely mind the discomfort when they are anxious to discover the cause of their trouble but it is difficult to perform many tests on children and it is therefore necessary to eliminate by the history as much as possible and only test for what is felt to be absolutely essential. Fortunately their diet is much simpler than adults and as milk, eggs and wheat are the chief offenders in their cases it is often possible to get a good result with the minimum of testing.

As to the extracts used, where the case is a pollen asthma it is rarely necessary to use more than the grass pollen (for June and July cases) or the rag weed pollen (August and September). Very few people are hypersensitive to other pollens to a degree to cause them trouble, although they are convinced that roses, goldenrod and other flowers are at fault. After many years of testing and treating we have discarded the use of these other pollens except in a very few instances.

From the skin tests it is possible, in a rough way, to judge somewhat of the degree of hypersensitiveness of the patient—the more marked the reaction the more susceptible the patient, and the smaller the dose needed to immunize. I do not believe, however, that it is possible to determine absolutely the size of the dose by measuring the size of the wheal.

Eye tests should also be done. A drop of the same solution placed in the eye will often give a reddening of the caruncle and conjunctiva with a sensation of itching and may cause sneezing and blocking of the nose on the same side by running down the nasal duct. It is easier to judge of the hypersensitiveness of the patient by his reaction to solutions of different strengths in the eye than by the skin reactions.

Horse epithelium is the most important of the animal emanations (which are, of course, quite different in their action from the animal sera), next in importance being cat and dog. Other animal dander for which tests should be made are rabbit (used in stuffing pillows and as a fur), cow, sheep and the feathers of chicken, duck and goose (used in pillows). Animal sera are of less importance but a test should always be made with horse serum and, if positive, the patient should be warned of the danger, to him, of diphtheria or other anti-toxin injection.

The number of skin tests to be done varies with the history obtained. In a clear cut pollen asthma it is unnecessary to subject the patient to tests with

all the foods and other substances. Here you are only interested in confirming the rag weed or grass pollen hypersensitiveness and its degree. Where the history is irregular it is necessary to test with animal emanations, sachets (as well as the pollens), food, and in fact all the preparations at your command.

Beside the skin tests it is essential to make a complete physical examination in all cases. This will enable you to rule out cardiac and renal asthmas, mediastinal growths, and possible foci of chronic infection located in sinuses, teeth, or the gastrointestinal tract. Of these the sinus infections are the most frequent and important and a diagnosis of such trouble should be followed immediately by proper remedial measures.

The blood count in asthma shows little that is characteristic except an increase of the eosinophile cells in the differential count. They are usually between four and ten per cent. but may go as high as sixty or seventy per cent. As yet we do not know the significance of this increase but its occurrence points to an asthma due to hypersensitiveness rather than to one of renal or cardiac origin.

TREATMENT.

The first thing is treatment of the immediate attack. Here our chief reliance must be placed on epinephrine used hypodermically. From five to fifteen minims of this drug repeated every half hour or so will control the great majority of asthmatic attacks, the relief lasting from a few hours to a day or more. I think this drug is too sparingly used, because of the impression that it raises blood pressure and eventually causes chronic hypertension. This is not true and you may easily prove to your satisfaction that epinephrine, administered during an attack of asthma, actually lowers the blood pressure from ten to thirty or more points by relieving the bronchial spasm. I have seen patients who have taken epinephrine for many years in considerable doses and who do not exhibit hypertension or any ill effects from it; nor, as a rule, do they have to increase the dose. Incidentally I may mention that it is of equally great value in other manifestations of hypersensitiveness such as urticaria, angioneurotic edema and those rare cases of shock following the ingestion of food or drugs to which a patient may be allergic. It is one of the few drugs which can be depended on to work and should be in every practitioner's armamentarium.

Morphine has been used for the acute attacks. Personally I have a great dread of it in such a chronic condition as asthma. It will, of course, relieve the immediate condition as well as epinephrine but the danger of forming a habit is too great and it should be used only in cases of the most urgent need. For milder attacks there are a number of pastilles, powders and cigarettes on the market, most of them with a base of stramonium leaves, which are very valuable and should be used to give the patient relief. Atropine may be given in doses of 1/200 to 1/75 of a grain as indicated. It can be given by mouth or hypodermically and is a valuable aid. Benzyl benzoate in doses of twenty to thirty minims four times a day has lately been highly recommended. What little

experience I have had with it has been most disappointing, but in view of the good reports from other observers I think it is worthy of a thorough trial.

The treatment of the underlying condition, of course, depends on the history and results of the examination and tests. Where the exciting cause can be eliminated from intimate contact with the patient, this should be done. Where this cannot be done the patient should be immunized against the exciting cause. To illustrate: Where the patient is hypersensitive to one or more articles of food, these should be eliminated from his diet. It often happens that after abstaining for a time he is again able to eat such foods in moderation without trouble. This is particularly true with children who are hypersensitive to egg or milk proteins. We have records of a number of such cases, hypersensitive in early childhood but now able to eat milk and eggs in adult life, without any trouble. This is in marked contrast to hypersensitiveness to animals and pollens which is very likely to continue during the life of the patient.

In the case of the boy hypersensitive to rabbit hair the treatment was simply to remove the pillows stuffed with such hair and to warn him of his enemy for the future. In cases of cat and dog hypersensitiveness, it is easy to immunize against the dander but as the treatment must be continued indefinitely it is wiser to remove the offending animal. It is not sufficient to stay away from the cat or dog—it must be entirely removed from the house and then all the rooms must be carefully cleansed several times to get rid of the dander scattered about.

In pollen hypersensitiveness it is ordinarily impossible for the average person to avoid exposure during certain times of the year. For the leisure class there is always the opportunity and excuse of a trip to Europe where they may escape the late hay fever and asthma but the grass pollen cases are as much exposed in Europe as they are in this country. We must here make use of active immunization and fortunately the results are excellent, better in fact than the results of the treatment of the hay fever with which the asthma is associated. Cooke reports a series of 135 cases of hay fever and asthma treated by pollen injections with the following results:

Asthma not improved.....	5 per cent.
Asthma slightly improved.....	6 per cent.
Asthma improved	36 per cent.
Asthma absent	53 per cent.
Hay fever not improved.....	4 per cent.
Hay fever slightly improved....	5 per cent.
Hay fever improved.....	85 per cent.
Hay fever absent.....	6 per cent.

In other words the asthma was entirely controlled in over half the cases while in thirty-six per cent. more a fairly satisfactory result was obtained.

The principle of the treatment is the injection of gradually increasing doses of pollen extract at intervals of from five to seven days. Such extracts are now obtainable from many commercial drug houses. The only disadvantage in their use is that the dose is graduated to the more sensitive cases in

order to avoid constitutional reactions and hence the doses are too small to immunize completely the less sensitive persons. The results, however, are surprisingly good. In the series quoted above the extract was standardized according to the amount of nitrogen contained and this enables one to graduate the doses very exactly. All patients were tested out by eye and skin tests and their degree of sensitiveness thus determined. It takes about fifteen to twenty injections all told and the treatment should be begun, if possible, six weeks before the season. If the patient is not seen until the hay fever and asthma have actually started then he is treated phylactically instead of prophylactically. Several small doses are given on succeeding days, then at intervals of two, three and four days until the end of the season. The results in cases so treated are almost as good as those treated before the season begins. By these pollen injections the asthma is not only relieved, but the patients are, as a rule, protected against secondary infections at the end of the season which very often prolong the asthma and cough until long after the pollen factor has disappeared and also renders them much less susceptible to attacks of asthma and bronchitis during the winter months.

I wish to emphasize again the importance of bearing in mind the value of epinephrine in this treatment. We endeavor to give as large doses as possible of the pollen extract without causing a general or very marked local reaction. Occasionally the patient receives a larger dose than he can stand and within a few minutes general urticaria, asthma, or hay fever develops. These reactions can be readily controlled by one or more doses of the epinephrine and are no more than a passing inconvenience. The patient should be warned of this and reassured. If such reaction occurs unexpectedly and is not treated the patient is needlessly alarmed and often refuses to continue a treatment which seems to him dangerous.

In patients hypersensitive to animals it is usually possible to avoid exposure and thus there is no necessity for active immunization. In the few cases where it seems best to immunize it is fortunately easy to do so. These are usually horse epithelium victims. The first doses should be extremely small but after about ten injections the patient is almost always able to come in the closest contact with horses without experiencing discomfort. Injections may now be given at monthly intervals or may be discontinued entirely if the patient is constantly exposed to horses and thus keeps up his own immunity.

Hypersensitiveness to sachets is best treated by avoidance of such sachets if the patient is only moderately hypersensitive. This will give freedom except on rare occasions when brought into contact with unusually severe exposure. In some cases it may be necessary to immunize with doses of sachet extract and the results are, as a rule, very good.

Patients exhibiting an allergic reaction to drugs are extremely interesting. Quinine and aspirin are the two most frequently met with. The reaction is not like an overdose of the drug in a normal

person but a typical allergic one—asthma, urticaria or even extreme shock and may occur after a very small dose. It is well to bear in mind there are such persons, who usually say they have an idiosyncrasy to such and such a drug, for we have records of at least two dozen aspirin cases, in one of which there developed an attack of asthma lasting three weeks following the ingestion of five grains, and another patient who immediately went into shock and died in five minutes from the same amount. It is probable that some cases of unexplained sudden death are due to a hitherto unknown allergy to one of these commonly used drugs. The treatment is avoidance of the offending drug and great care on the part of the patient that he never receives a dose of it by mistake.

Many cases of chronic asthma are complicated by an accompanying chronic bronchitis. Some of these will clear up when the underlying cause of the asthma is removed but many of them will require treatment for the bronchitis as well as the asthma. Here it is well to have an autogenous vaccine made from organisms recovered from the washed sputum (this must be done by a competent bacteriologist to get any satisfactory results) and these must be properly interpreted and the injections of this vaccine should be given over a long period of time. The maximum dose should be at least three to six billion and the injections should be continued for some time after the organism has disappeared from the sputum.

Local treatment for all foci of infection is, of course, essential. Polypi should be removed, sinuses drained, diseased tonsils thoroughly removed and teeth radiographed and treated. Every effort should be made to place the patient in as normal physical condition as possible.

You will frequently be asked whether a change in climate is advisable, and if you are honest with your patient and yourself the answer is usually no. I admit that the temptation is strong, when you have been dealing with a particularly obstinate case, to shift the responsibility to some other doctor living in California, or Texas, or Colorado, but the chances are that the patient will there encounter the same pollen, pillows, food, sachet, or animals which he encounters at home and if a change is made it is often just as efficacious to move next door or across the street and much cheaper. Be conscientious and persevere until you have solved the problem yourself. An exception to this rule can be made in a few cases, complicated by tuberculosis or run down by long suffering or a chronic bronchitis, who occasionally need a change in climate to build up their general health.

PROGNOSIS.

This has been touched on under treatment. The prognosis depends on the diagnosis. At the present time about seventy per cent. of all cases can be diagnosed. Over one third of these are pollen asthmas and the figures already quoted show that ninety per cent. of these patients can be made quite comfortable. Of the animal and food asthmas the great majority can be entirely relieved. The really difficult cases are those with a complicating infection, sinus, bronchial or intestinal. The larger

proportion can be relieved by appropriate treatment but they require long and careful investigation with a maximum of patience and perseverance on the part of both doctor and patient. As to the undiagnosed thirty per cent.—this class is steadily becoming smaller and I am sure will continue to decrease. Each difficult case solved is an advance. It took two months of hard work to solve the problem of the lad who was sensitive to rabbit hair but when that was achieved three more difficult cases were found to be similar and all were relieved immediately.

The word relieved is here used intentionally for it cannot be said that these patient are cured any more than a diabetic is cured who keeps within his sugar tolerance and is symptomless and sugar free. They are still sensitive to their particular substance and as far as we know they will continue to be so indefinitely. A few rare cases show complete cure, some spontaneous and some as the result of treatment but they are the exception and we do not know the reason for their recovery. However you will find that patients care very little whether you use the word cure or relieve. If they do not have asthma they are, as a rule, satisfied.

I wish to introduce here the case records of two rather typical and dissimilar asthmatics which will serve to illustrate somewhat the method of treatment.

CASE I.—Male, aged twenty-five, single, packer by occupation. Family history negative as far as any hypersensitiveness is concerned. Past history, pneumonia three times, in infancy, at seven, at eighteen; typhoid fever at seven; no malaria, tonsillitis nor rheumatism. No hay fever nor hives. No food hypersensitiveness as far as known.

Present illness.—Asthma began when he was seven, following typhoid fever and a cold. He has had it more or less ever since, all the year round. He knows that horses bother him but does not think he is affected by cats or dogs. Diet is general, including milk and eggs.

Physical examination.—Thin, rather pale. Weight one hundred pounds. Heart normal, blood pressure 120-80. Lungs hyperresonant and many coarse squeaking râles. Tonsils large and boggy. Nose and sinuses negative. Ears, right drum perforated, left retracted. Urine negative. X ray of lungs shows bronchitis of long standing, no tuberculosis. Sputum negative for tubercle bacilli. Culture shows streptococcus and Micrococcus catarhalis. Vaccine made. Differential blood count—polynuclears 43 per cent., lymphocytes 41 per cent., eosinophiles 8.5 per cent., transitionals 4 per cent., basophiles 3.5 per cent.

Skin tests extended over several days showed positive for rag weed, negative for grass pollen, positive for horse and chicken epithelium, negative for other animals, and for all foods and sachets. Later he gave positive reactions for rabbit epithelium, and some pillow feathers and the stuffing from his mattress. His treatment has been as follows, first he secured a new position as his packing job was very dusty and would tend to increase his asthma by mere mechanical irritation. He was told to get rid of his feather pillows and use pillows stuffed with silk floss instead. His mattress was

wrapped in several sheets to minimize the dust coming from it. Of course a silk floss mattress would be better but they are expensive. His rooms were carefully scrubbed and cleaned to remove all traces of the chicken feather dust. He was given injections of his autogenous vaccine and horse epithelium at weekly intervals.

Course.—The patient was first seen on October 13, 1919, and his asthma continued until the first week in November, when the injections had reached a sufficient strength to begin to give him immunity. November 14th he had some asthma following his injection. December 18th-19th slight asthma. January 4th and 10th slight asthma. None after this to date (March 10, 1920). January 17, 1920, weight 103 pounds, differential count eosinophiles 12.5 per cent.; February 14, 1920, differential count eosinophiles 8.5 per cent. March 6, 1920, weight 104 $\frac{1}{4}$, some cough, no asthma since January 10th. Is working right along.

Of course this man is not cured of asthma and if he is again exposed to the substances to which he is hypersensitive he will react as before but he knows his enemy and can avoid it. He still has bronchitis and it may take a long time to cure that, but I am sure he will get rid of it eventually. He will need rag weed injections in the summer and fall. If he can avoid the asthmatic attacks, which have been almost constant for many years, I think he will be able to stand slight exposures without treatment and without getting into trouble.

CASE II.—Male, aged forty-nine, single, iron manufacturer. Family history, negative for hypersensitiveness. Past history negative except for scarlet fever, without nephritis, and rheumatism, without heart complication. Uses alcohol moderately; hearty eater; six to eight cigars a day; no headaches; no change in weight.

Present history.—The patient had his first attack of bronchitis twenty years ago, during November and December. No asthma with it. Had a similar bronchial cold each October to December for five years. All right the next year but the following year he had severe bronchitis and asthma with it. Following this he took great precautions against catching cold and was well until 1919. In January, 1919, during a few cold days he had constriction of the throat, pain in the precordium and dyspnea. In June, 1919, he had asthma for two nights, went to Canada for two weeks and was better there, but since his return he has had asthma more or less all the time up to the present (January 6, 1920). The present attack has lasted since December 25th. He often has heart oppression. The cough is worse in the morning. The asthma seems to be the result of the bronchitis. There is no real hay fever, has occasionally had pain after eating clams but no trouble lately. One attack from eating scallops. Knows of no animal hypersensitiveness. He keeps a dog, and his iron foundry is very dusty.

Physical examination.—Weight 183 pounds. Blood pressure 118/90. Few capped teeth; the x rays of the teeth were negative. Heart, systolic murmur at apex, slightly enlarged to left, regular.

Electrocardiogram of heart normal. Lungs, signs of a chronic bronchitis and emphysema. The abdomen was negative. The Wassermann was negative. Urine 1,024, no albumin, no sugar, no indican, few hyaline and granular casts. Blood differential polynuclears 74 per cent., lymphocytes 23 per cent.; eosinophiles $\frac{1}{2}$ per cent., transitionals 2 per cent., basophiles $\frac{1}{2}$ per cent. Sputum negative for tubercle bacilli. Vaccine made containing staphylococci, streptococci, and *Micrococcus catarrhalis*, three billion to the c. c. Skin tests negative for pollens, animal emanations, sachets and dusts, marked for beef, lamb, clam, halibut, lima bean.

Treatment.—Told to omit beef, etc., from his diet and given injections of vaccine. These were started January 15, 1920, and given every five days at first. He had distressing attacks of asthma January 16th, 19th, 23rd, 28th, 29th. By this time he was getting one c. c. of the vaccine and had been on a diet three weeks. He was last seen March 10th and had had no asthma since January 29th. He still gave marked skin reactions to beef, lamb and clam.

An interesting fact in his history was obtained only after his test had been made. He said that he was very fond of beef and accustomed to eat it six or eight times a week. He also said that he was very fond of clams and that when the asthma commenced in June he was eating them frequently. At times they gave him gastric distress but at other times he ate them without trouble. His skin test was negative for them at first but markedly positive on two later occasions. It is probable that he has a cardiorenal condition as well as asthma, as but with a normal electrocardiogram and blood pressure I do not think it is very serious and restricting his meat intake will do him no harm at least. His bronchitis apparently cleared up under vaccine injections and if he experiences a second infection I think it will be wise to have another vaccine made. His is apparently a case of food hypersensitiveness with a complicating bronchitis.

CONCLUSION.

If this paper leaves you with the impression that the diagnosis and treatment of asthma are now simple matters I have failed in my purpose. It is only the rare and exceptional case where you can make a few tests, tell the patient to banish the family cat or remove such and such a pillow and be well forever after. Both you and your patient will become discouraged time and again and it will try your resourcefulness to the limit. What I do wish to make clear is that asthma is no longer the hopeless problem that it has been in years gone by. Inspire your patient with the same enthusiasm and confidence that you have in the search and keep everlastingly at it. The result in suffering relieved will more than repay your effort and the unsolved cases will become fewer as our knowledge increases.

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BRONCHIAL ASTHMA IN CHILDHOOD.

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It is fairly well established that nearly all cases of bronchial asthma in children are anaphylactic in origin, although influenced by such factors as the mental state and climatic conditions. It is only by keeping this in mind that we can hope to obtain permanent results with any treatment. Bronchial asthma is only one of the many forms in which anaphylaxis manifests itself. We shall gain much valuable information by considering the phenomenon of anaphylaxis as a whole, before going into this one particular manifestation.

The following is a list of diseases which have been found to be forms of anaphylaxis and as time goes on we may have many others to add to it: Hay fever, bronchial asthma, urticaria, angioneurotic edema, certain skin diseases (or rather certain types of these diseases, such as eczema), cyclic vomiting, other gastrointestinal upsets, possibly ivy poisoning, migraines, serum disease and certain reaction to drugs (1).

What do we mean by anaphylaxis? It can be defined as an abnormal reaction of the organism to certain substances. Experimentally, it has been produced in the following manner. When a foreign protein is introduced into the organism, no reaction occurs after the first injection. If, however, we wait a suitable period of time, a second injection will produce definite changes varying with the animal used for the experiment. The first injection has sensitized the animal and the changes following the second injection are called anaphylaxis.

The following are the reactions observed in various animals: spasm of the bronchioles, urticaria, increased peristalsis, and fall in blood pressure. There is also an eosinophilia. These reactions also occur in man, although we rarely see marked falling of blood pressure, except possibly in some of the cases of death from antitoxin in highly susceptible subjects. Animal experimentation, moreover, has brought out valuable data having a practical application. Sensitization has been found to be a result of heredity, inoculation with a protein, inhalation, inunctions, intravenous injection, introduction by mouth or instillation into the conjunctival sac. From this we may see that it is quite possible to produce anaphylaxis by the improper introduction of certain foods into the diet. We know, for instance, that a number of people suffer from urticaria after eating shell fish, or strawberries, articles of food obtainable at certain seasons, and therefore there is a sufficient interval between the introductions to bring about sensitization in the individual. It is quite possible that anaphylaxis to white of egg is due to the custom of giving albumen water to infants suffering from gastroenteritis. For this reason, when a new article of food is introduced into the diet, it is best given in small quantities and in frequent increasing doses so as to prevent a possible change of sensitization. Of course there

is no doubt that a large number of patients inherit their anaphylactic tendencies. We have sufficient proof of this among our patients, a large number of whom have at least one parent suffering from asthma or one of the allied conditions. Recently there was in the wards of the Postgraduate Hospital a breast fed baby suffering from eczema. In spite of the fact that he was breast fed, and never had partaken of anything but mother's milk, he was found to be sensitized to several other foods.

Experimentally, it has been possible to transmit anaphylaxis by what has been termed passive anaphylaxis. This is accomplished by injecting the blood of a sensitized guineapig into a normal one, after which it is found that the second animal has become anaphylactic to the same proteins as the first. There are several cases on record in which, after a transfusion from the blood of an asthmatic, typical asthma has developed in a subject previously free from respiratory embarrassment. Experimentally, depending on the initial dose used to sensitize, it takes a small or a large quantity of the protein to produce an attack. The same applies in the various anaphylactic manifestations in man.

Sensitizing substances cause sensitizations which are specific to that protein or to closely related ones. It is quite common to find a child sensitized to a certain food who will also react to species very closely related. Apparently it is necessary, in order to establish anaphylactic phenomena, to have a proteid which is not reduced lower than the polypeptides; recently, however, anaphylaxis has been reported from quinine and aspirin. I, personally, know a doctor who will sneeze when a box of ipecac is opened at the other end of the room and will suffer a typical attack of bronchial asthma should he get near enough to this substance.

Why anaphylaxis takes on one form more than another is hard to determine, except in certain cases of hay fever or asthma of the inspiratory type. Here we have direct contact between the sensitizing substance and the affected part of the organism. All cases have in common a disturbance of the sympathetic or autonomic fibres supplying the affected organs. It is possible, moreover, to get a combination of these phenomena, and it is not uncommon to find in a child, given egg for the first time, a severe swelling of the lips, an urticarial rash all over the body, and a marked attack of asthma will develop.

Asthma has been described as a spasmodic contraction of the bronchioles, accompanied by hyperemia of the mucous membrane, and characterized by wheezing low râles on expiration, with numerous moist, musical or crackling râles heard all over the chest. Textbooks have laid considerable emphasis on the presence of Charcot-Leyden crystals in the sputum and an eosinophilia of about ten per cent. in the blood. In children, we do not necessarily get all these symptoms and we can divide asthma into four clinical groups, which of course merge into each other and are really only degrees of severity:

1. Frequent coughing spells, which vary in duration and frequency. This type is very common in infants.

2. Frequent attacks of bronchitis, not associated with any rise in temperature. These two types are rarely recognized as asthma.

3. True bronchial asthma attacks. These are fairly easy to diagnose. During the interval the patient feels perfectly well, but on auscultation a few musical râles can sometimes be heard in the chest. Immediately preceding the attack there is often irritability and headache. When the attack is severe, the patient sits up and grasps some firm object, the face is pale, and the lips, fingers and eyelids become livid. The expression is anxious, there is difficulty in breathing and limited expansion of the chest and the chief difficulty appears to be in expiring air. The respirations, for this reason, are slowed down in number to ten or twelve. Inspiratory sounds are short and soft, expiration is long and accompanied by a low wheeze. The accessory muscles of respiration are brought into play and to help this, the shoulders are raised. On percussion hyperresonance is heard over the chest. In older children, the area of cardiac dullness is diminished, although there is often dilatation of the right side of the heart. On auscultation, the expiratory sound is prolonged and wheezing and sonorous râles are heard all over the chest.

4. Constant asthma.

In all cases the essential feature is a recurrence at intervals of difficulty of respiration or cough, independent of any infection of the air passages.

There are, therefore, many diseases which may simulate bronchial asthma and it is well to eliminate these before making a positive diagnosis. The more common are: chronic bronchitis, whooping cough in infants, and reflex causes. The reflex causes can be divided into mediastinal enlargement, foreign body in the larynx, bronchi, lung, ear and esophagus, and possibly worms in the gastrointestinal tract. All these can be determined by either the direct examination or the x ray.

Mediastinal enlargements are rather frequent, enlarged thymus being perhaps the most common. This is, as a rule, characterized by coughing spells, appearing shortly after birth and made worse by flexion of the chest; there may or may not be a harsh inspiratory sound and râles in the chest. Percussion of the thymus is of little value and apart from the history, the x ray is the only reliable aid to diagnosis, beside being the easiest and best mode of treatment. Enlarged mediastinal glands, usually tuberculous, often cause coughing spells. These are demonstrated by the d'Espine sign, and the x ray. The Von Pirquet test will help to decide in a tuberculous case. We must not forget that occasionally Hodgkin's disease, or leucemia, may affect these glands early, but this is a remote possibility. Occasionally congenital laryngeal stridor, laryngismus stridulous, and retropharyngeal abscess may be mistaken for bronchial asthma, and it is well to keep this in mind. Once we have decided that we are dealing with a true case of bronchial asthma, certain phases in the history should be looked into, as likely to give valuable information as to the etiology.

1. When did the first anaphylactic phenomenon develop? This may immediately put us on the trail.

To illustrate: The child who had asthma following bronchopneumonia would make one think at once of a bacterial origin of the disease; or a child in whom asthma develops at the time of weaning, or when put on cow's milk, probably has a dietary cause for his affliction.

2. Time of the year the attack occurred. Asthma in winter usually suggests a bacterial cause; asthma at a definite season of the year is suggestive of the pollen of plants blooming at that particular time; or foods in season (certain fruits, for instance).

3. Location. We may find that a certain room, a certain house, or certain country localities will bring about an attack. When traced to the country or to a garden, pollens from plants come under suspicion. A certain room leads to a careful examination of the premises and perhaps the finding of the offending factor. When a whole house, the problem is less easy. It may be the particular food served in that house, a pet cat or dog, or the proximity of neighboring stables.

4. Time of the day. Cases of asthma in which the attacks occur only at night suggest something connected with the patient's bed, such as the feathers in the pillows, the hair in the mattress, or the blankets.

5. Finally, patients will often have noticed themselves, or when placed on their guard will frequently discover some factor in the occurrence of an attack. In this way we have been able to find the following variety of things to be causative factors (at least one of them): dog, cat, rabbit, horse, smell of herring, a cold, ipecac, hay, linseed, various foods, certain types of canned foods (depending on the brand), plants, pillows, stuffed animals, and skins.

In order to get a clear idea of the subject, it is advisable to group the causes of bronchial asthma under the following classification:

Inspiratory cause.—a, Pollens from plants; b, animal emanations, and animal hair or dander, bird feathers; c, dust from certain drugs.

Injected cause.—Serums (antitoxins, etc.).

Ingested cause.—a, Egg; b, milk; c, grains; d, vegetables; e, meats; f, fruits; g, nuts; h, fish and shell fish; i, spices; j, drugs.

Bacterial cause.—a, Focal infection (tonsils, teeth, gallbladder, appendix, etc.); b, bacterial infection, from the respiratory or the gastrointestinal tract.

In the children's clinic we have found that inspiratory and ingestion causes were the most frequent and that usually there were several causes not necessarily all belonging to the same group. Among the foods the most common have been egg white, milk, and wheat. Focal infection does not appear to play a very important part, although no doubt it does occur. As a rule bacteria from the nasopharynx are the source of the sensitizing bacterial protein.

In determining the etiology of the asthmatic attacks, we are greatly helped by the skin reactions. Briefly, these are performed as follows: The proteins from various foods, bacteria, and emanations are isolated, in order to be sufficiently concentrated to produce a reaction, or they can be obtained ready prepared by certain commercial labora-

tories. They are then either injected intradermally, in solution, or, which is easier, with the commercial preparations. The skin is gently scarified with a scalpel, a drop of decinormal solution of sodium hydroxide placed on it (to make a solution of the protein), and a small quantity of the protein dissolved in this. A positive reaction is indicated by the appearance of a white wheal surrounded by an area of erythema, at the site of the application of the offending protein. It often happens that asthmatics have a certain degree of dermatographia and for this reason it is wise to compare with the control. The anaphylactic wheals are usually irregular in outline and their size does not necessarily bear much relationship to the degree of severity of the disease.

TREATMENT.

As it takes considerable time to determine the provocative agent, it is necessary to do something to relieve the discomfort of the patient. The following are some of the drugs which may be used to give relief:

Adrenalin.—This, as a rule, clears up a case, or at least gives marked relief, within a few minutes, but, because of its potentiality and the fact that it loses its effect if repeated often, it should be given only during severe attacks or in cases where there is only an occasional attack, say once a year. Adrenalin can be given in doses from three to ten minims, of the one to a thousand solution, by hypodermic injection.

Benzyl benzoate.—This is a harmless antispasmodic and in many cases gives very satisfactory results. Unfortunately, it does not relieve in all cases and has the disadvantage of having an unpleasant and lasting taste. In children who are old enough I give the drug in capsules containing two minims each, four times a day. In the ten per cent. solution, the dose is half a teaspoonful four times a day for a child six years old. Increased doses do not appear to be more effective, although I know of one case in which benzyl benzoate afforded absolutely no relief when given in one half teaspoonful doses but which responded to one teaspoonful doses, when two weeks later the patient had his next attack. Benzyl benzoate is best given continuously to patients having frequent attacks, but this is not necessary in those having only occasional asthmatic attacks.

Atropine.—When given up to the physiological limit it will sometimes be of benefit, but I have never found it quite satisfactory.

Iodides.—These drugs may sometimes improve the patient's condition, and can be given in the form of syrup of iodide of iron as a general tonic in all cases.

Drugs, such as aspirin, and the bromides, are of doubtful value; nitrite of amyl or nitrite fumes are beneficial in relieving spasmodic breathing during the paroxysm.

Recently the French and British have found that peptone by mouth or by hypodermic injection prevents anaphylaxis, and they have been giving it in doses of five grams, three times a day, by mouth.

Auld has reported good results in a certain number of asthma cases by this means. We have tried peptone for a few weeks only in our clinic, so that

we are unable yet to report any definite results (2).

My own experience has been that no drug will help in all cases, but usually some one particular drug will help in each case. Of course, all these measures are merely palliative. We can only expect results by investigating the causes of the anaphylaxis and eliminating such causes as are found. This is done as follows:

The patient is placed on a diet of milk (including milk products), yoke of egg, wheat, potatoes, and one vegetable. He is then tested out for each of these proteins, and should one of them be found to be anaphylactic, it is removed from the diet list. It is also advisable to test with various feathers if their proteins are available. The patient is kept on this restricted diet for a week. Should the asthma be entirely due to food proteins, there will at once be marked improvement. The course to follow then is to test out for more foods and add them to the diet one at a time, eliminating, of course, all those giving positive skin reactions or symptoms. The skin reactions are not infallible and for this reason we should supplement each by a clinical test. It is also important to give these foods in a simple form, otherwise there may be a trace of some other substance which might precipitate an asthmatic attack.

To illustrate: We have in our clinic a child who is not sensitized to either pork, beans, or tomatoes, yet we have found, as a result of several experiments, that he will get an asthmatic attack if he eats a particular brand of pork and beans. By proceeding in this way, we are able to determine the majority of foods to which the patient is sensitized. We will take up later the treatment of these cases of a purely alimentary type.

Should we get no result after a diet limited to the few foods mentioned previously, we must next try to find some other causative factor. Inspiratory causes should be looked for. Pollens in the city can fairly well be eliminated but emanations may come from so many sources that we may fail to find their origin. It is best to give the patient a cotton pillow and mattress, to remove all skins from floors, such as bear or tiger, and eliminate pets, like canaries, dogs and cats. The proteins from dog hair, cat hair, horse dander and feathers from chickens and geese should be tested. Obviously we cannot obtain the proteins for all the various animals, therefore, should these measures fail, the best thing to do is to have the child brought to a hospital and removed from the environment of all sources of animal or flower emanations. This will very often clear up the case and confirm the diagnosis.

The next step is to find the cause by a process of elimination. It is well to remember that contact with the offending material, even for a few minutes, will bring about an attack several hours afterward. Dr. Pisek reported a case in which the patient was sensitized to chicken feathers and when placed upon a cotton pillow was asthma free. The child had another mild attack afterward, traced to a pillow fight the previous evening. Should all these precautions fail to discover the real cause, we can reasonably assume that we are dealing with a bacterial type. All obvious foci of infection, such as caries and infected tonsils, should

be removed. Results are obtained occasionally by this alone. By skin tests it is sometimes possible to isolate the offending organism, in which case a stock vaccine given in gradually increasing doses is administered. Of more value is a culture from the nasopharynx, grown on both agar and bouillon, and a mixture from these used as a vaccine. Some authors advise growing the predominant organism only, but unless this happens to be the one giving the positive skin reaction, I do not believe it is necessary. In case of failure, and as a last resort, either a second vaccine from the nasopharynx or a vaccine grown from the feces may be tried. In the case of pollens, according to the season of the year, and by means of the skin tests, we are also able to isolate the plant for susceptible individuals. These are the only patients who are benefited by changes of climate, sea trips, or seaside resorts with predominating sea breezes.

In the case of food anaphylaxis, it often happens that the patient is sensitized to some widely distributed article of diet, milk for instance, lactalbumen being the most common offender. This can be eliminated by boiling the milk and allowing it to cool, the lactalbumen rising to the surface as thick skin which can be removed. Unfortunately a great many children object to the taste of boiled milk, but it can at least be used for the cooking of their food. Occasionally we have found that dry milk was tolerated in these cases. Yolk of egg rarely brings about any anaphylactic disturbance, while the white is a frequent cause of asthma. Clinical experience has shown that the cereals, when toasted, are less likely to cause anaphylactic changes and can be taken with less harm in this way.

From the most common foods, we can desensitize the patients with small increasing doses of the protein hypodermically. Such preparations are put up in commercial laboratories, as are also a few of the animal emanations and pollens. With such simple food as white of egg we can desensitize the individual by giving a very dilute solution by mouth three times a day and increasing the dose by a minim each time until tolerance is obtained.

During acute attacks, dietary in origin, removing the offending substance by stomach lavage will sometimes afford relief. As time goes on the treatment will probably be considerably simplified, but at present it is chiefly a question of making the patient understand what may cause an attack and when possible, desensitize.

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Puncture of the Superior Longitudinal Sinus.
—M. Gonzalez-Alvarez and J. Gonzalez Edo (*La Medicina Ibero*, April 10, 1920) find that this route is one of great advantage in taking Wassermann specimens, in giving quinine solutions in malaria, neosalvarsan in lues, serum in diphtheria, and tetanus; in administering alkalies in acidosis, and for the transfusion of blood. There is only one contraindication, namely, hemophilic diathesis.

THE TREATMENT OF ASTHMA WITH BENZYL BENZOATE BY INJECTION.

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Among the unsatisfactory and at times troublesome patients are the asthmatics. In the clinic, as well as in private practice, one is often confronted by the obstinate asthmatic who, in spite of every mode of treatment, obtains little or no relief. As is the case with all diseases, the etiology of which is not known or definitely established, one frequently comes across reports by different observers, who assert that successful results have been obtained with various methods of treatment. Strange as it may seem, those same methods applied to our patients often result in failure.

While a good deal has been written lately about the use of benzyl benzoate in cases of true asthma, very little is said about its use by injection in that condition. This point is of particular importance when one finds, as we have, that this drug will give gratifying results by the hypodermic route, where oral administration fails. The following case will serve as an illustration.

CASE.—Mrs. L., fifty-four years of age, came under my observation about one year ago, with a history of bronchial asthma of fourteen years' standing, during which time she was under fairly constant medical treatment. Her attacks, which varied in severity and frequency, were as a rule promptly relieved by injections of morphine and atropine or adrenalin. About eight months ago her asthmatic attacks increased in both frequency and severity. Adrenalin would no longer give her relief, while the dose of morphine had to be increased. She was put on benzyl benzoate in twenty drop doses every four hours by mouth. She was completely relieved in several days and remained so for two months. Without any apparent cause she suddenly began to suffer severely, being in an almost constant state of dyspnea. Neither adrenalin by injection nor benzyl benzoate by mouth gave her the slightest relief. The hypodermic administration of morphine, one third to one half a grain every four to six hours, was necessary to give her temporary alleviation. This condition continued for about two weeks. She became obstinately constipated, took scarcely any nourishment, her skin was dry, tongue parched, heart action poor, pulse rapid and weak, thus presenting a picture of misery. I put her on benzyl benzoate, twenty drops every three hours by hypodermic injections, and digalen, ten drops every four hours by the same method, at the same time cleansing her alimentary tract with salines and colonic irrigations. In three days she was completely relieved, was out of bed at the end of a week, and has been free from attacks since.

I believe we are justified in emphasizing here the value of digitalis in asthma, particularly in cases of long standing, where the resulting dilated right heart, with the consequent impaired pulmonary circulation, adds greatly to the sufferer's embarrassment.

1331 PROSPECT AVENUE.

EXAMINATION OF THE EYE ESSENTIAL IN PHYSICAL EXAMINATION.

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Today the fashion of endeavoring to trace general constitutional disturbances to foci of infection and to toxemias of various origins is prevalent and records show strikingly important results from this wave. The imbalance of interaction of the endocrines also occupies a prominent place at present. Enthusiasts in these important studies sometimes neglect other time honored determinations, the treatment of which, when found, has given relief repeatedly.

The necessity of examining the eyes is seldom disregarded nowadays, when headaches and eye discomfort and pain exist, but symptoms that occur remotely from the eyes are often overlooked as being the probable result of existing eye affection or undue ocular strain. Indigestion, flatulent and other dyspepsias, malaise, insomnia, as well as headaches of various characters, not infrequently disappear when a dry and roughened conjunctiva is cleared up by treatment or when correcting glasses for existing errors of refraction and imbalance of extrinsic ocular muscles are worn for a time.

Valuable information may be elicited from a complete ophthalmoscopic examination of the fundus of the eye that cannot be obtained in any other way. When certain changes from the normal are observed, they are often leading indicators of some general or special malady that is now present or has existed heretofore.

Retinal hyperemia, hemorrhages, fatty degeneration and atrophy or combinations of two or more of these, which may be observed in the eyes of patients with nephritis at times, aid in determining an existing kidney affection. Indeed the so-called typical albuminuric retinitis in which fatty degeneration and atrophic changes occur about the macula (macular star) is not as frequently observed as the less elaborately produced lesions of this affection. The recorded proportion of retinitis in nephritics varies from nine to thirty-three per cent. and it would be considerably higher if there were included the minor blurrings of the disc and retinal details, the result of slight alterations in the walls of the blood vessels and the reaction in the retinal tissue to cytotoxic substances in the circulating blood. In diabetes, similar changes are noted in the fundus that occur in nephritics, but retinal fatty degenerations and atrophies occur in the equatorial regions more frequently than about the macula as in albuminuric retinitis. When retinal degenerative changes are noted in diabetes the disease is usually advanced and prognosis as to life is grave, just as similar changes in the retina of patients with nephritis denote a bad prognosis. Cataracts are not uncommon concomitants of diabetes.

In a recent attack of syphilis an eye ground examination is expressly required by leading syphlographers, particularly when intravenous medication with arsenical preparations is to be employed, as certain diseased conditions when found in the eye fundi may contraindicate its administration or compel modification of its use. Later in life when other untoward general conditions develop you will discover, on taking a previous history, that a luetic infection is frequently denied or forgotten or it may have been innocently contracted, and the early evidences may have disappeared without any medication. If scars, atrophies or old exudates are seen in the fundus oculi as the result of the early stages of this disease, a doubtful tertiary aspect may be cleared up years after the occurrence of the initial infection.

Arteriosclerosis may be observed as a kinking and tortuosity of the smaller retinal blood vessels in the earliest stages, and in the later stages by an indent noted in a vein where an artery crosses it. When these changes are noted, similar vascular conditions may well be suspected in the cerebral blood vessels. If twenty-four hour interval observations of the fundi of the eyes are made in all cases of apparent or suspected recent fracture of the skull, sufficient edematous changes may frequently be noted which will suggest a possible intracranial pressure. This is often verified by lumbar puncture. A cranial decompression operation in these cases removing a cerebral blood clot or just relieving the pressure, is reported to have saved many lives.

The location of basal brain injuries, softenings and hemorrhages, occurring in the pathways of the visual fibres from the back part of the eyeball to the perceptive centres of vision in the occipital lobes of the brain, may be traced when existing hemianopsias or even less marked amaurotic areas occur in the retinae, together with a notation of pupillary activities, when light is thrown upon the retina of one or both eyes. A fundus examination has at times revealed a choked disc, the result of a brain tumor, in patients admitted to our hospitals suffering from persistent uncontrollable headaches and said to have an obscure neurological condition.

A neurological examination that includes the following data derived from an eye examination is always more valuable than one that does not: The diameters of each pupil, their shape, the difference in their size, their reactions to stated stimuli, the state of health of the extrinsic ocular muscles, the refraction error, if one exists, the degenerative edematous, inflammatory and other untoward changes in the optic nerve head and retina, if any are present, the variations in the structure of the retinal blood vessels, amaurotic areas in the retina, visual acuity and visual fields for form and colors.

A doubt as to the diagnosis of meningitis is often cleared up by characteristic changes that may be seen at the time in the fundi of the eyes as the result of this disease. Migraine symptoms are sometimes relieved by wearing accurate correcting lenses when a refraction error or extrinsic ocular muscle imbalance is found to exist and occasionally a cupping of the optic discs is discovered in a fundi

examination denoting a glaucomatous process that may be the source of the symptoms. Tonometric and other examinations usually verify the diagnosis by recording an increase in the intraocular tension.

Monocular papilledema suggests pressure extending to the optic nerve from diseased adjoining nasal accessory sinuses, particularly the frontal ethmoidal and sphenoidal. Toxemias lasting for a time tend to disturb the subretinal pigment layer and cause particles of its pigment to migrate into the retinal tissues proper, changing the color of the retina, from that corresponding to the complexion of the patient and in some instances giving the eye ground throughout a pepper shaken appearance.

The general conditions cited in this paper are ones most commonly met and for this reason they are reviewed with some of the accompanying eye changes to show the importance of an eye examination in all thoroughly studied cases.

127 WEST FIFTY-EIGHTH STREET.

SUPPLEMENTAL ACTION IN REPARATIVE MEASURES.

With Special Reference to Serogenic Remedies Reinforced Through Kinotogenic Agencies.

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Evidence is accumulating to the effect that groups of efficient therapeutic procedures mutually supplement each other, hence results can be obtained in proportion to the resources of each being understood and judiciously applied. Of the four major groups, a, medicines, b, serums and vaccines, c, mental readjustments and, d, so-called physical remedies, the last have not yet come to be accredited the importance they deserve, nor are the established principles adequately understood or appreciated. All clinical problems, except the simplest, need to be approached from most, if not all, of the directions indicated.

Let me here offer further evidence of interaction between the two groups, the serogenic and the kinetogenic or the physical, or mechanical. Also permit me to suggest a descriptive name for this last group of agencies which seems best calculated to convey an exact meaning, and that is kinetogenic instrumentalities, since they all involve motivation in some of their diverse modalities. Among these are electricity (electrogenics), heat and cold (thermogenics), light (photogenics), the adjustments of the mind or emotions (psychogenics), and orthogenics, physical or morphological adjustments of the body, the muscles, joints, reflexes, etc., through movements on or by these structures, i. e., passive or active.

Another point offers, namely: Any remedial agency induces effects in a twofold manner, yet in varying degrees, by a, influencing the organism as a whole, and b, upon areas or localities or groups of structures. It seems to be assumed by many that the effects of most medicaments or serums or vaccines are so widely diffused that their influence is exerted

uniformly upon the organism as a whole. The fact is, or many facts are becoming adduced to prove, that we have much to learn of these varying local states wherein energies in their transmission are often delayed, retarded or accelerated or otherwise unequally distributed. In respect to the sera and the problems of immunity, Sir Almroth E. Wright has told us much, especially in his recent communications.

The central aim of all therapeutics may be described as the achievement of cellular poise, the equalization of blood and lymph propulsion leading to wider distribution of vital fluids, principles, hormones, antibodies, adrenoxidioxidase and other essentials to life processes, also the reduction of end products to conditions favorable for elimination. The instrumentalities include hydrostatic, hematogenic, thermogenic, and the profoundly complex reflexogenic mechanisms. Likewise there are now coming to our attention electrotonic factors which may prove to be of yet deeper significance. The great regulative agencies, the ductless glands, exert influences throughout which must at all stages be reckoned with.

During the processes of functional fulfillment, many associated or collateral factors combine to bring about and maintain a stabilization. The problems thus stretch out beyond our present ken. However, much improvement in therapeutic efficiency will result from achieving a practical familiarity with those forces of which enough is already known.

Among the chief enterprises is the equalization of the reflexes. In particular there may be mentioned the graphic phenomena of, 1, tonicity in the cardiovascular renal mechanisms; 2, resistance in the blood stream and the defence of the organism against interferences with blood flow; 3, tonicity in the various tubular and hollow viscera, the digestive, the respiratory, the reproductive, the genitourinary and other cycles and groups of structures; 4, the extreme significance of balanced tonicity (isotonicity) in the muscles, not alone the large muscles but the small ones as well, as forming parts of, and distributed among these viscera, which is of equal importance, as I have tried to show elsewhere. In short, health consists of maintaining poise in the neuromuscular cycle, especially the release of tonic spasm, cramp, or in the correction of undue relaxation. This attribute of quantivalence it is the prerogative of the mechanisms of movement or rest (kinetogenic instrumentalities) to bring about most promptly and permanently.

An organism would obviously be in a position of far greater advantage to profit by any remedy introduced into the circulation, if measures were available whereby these varied processes could be made to cooperate harmoniously.

Only when the reflexogenic, the neuromuscular and the thermogenic mechanisms, in short equalized tonicity, temperature and propulsion are, and remain at their norm, or so near their norm as to functionate economically, is it possible for the subsidiary, collateral or finer mechanisms to perform their functions to advantage. Only when the structures of an organism exhibit fair tone, uni-

formity of pressure, hydrostatic and osmotic competency, temperature, automatic selfregulation of those forces essential to distribution of nerve impulse, also static or kinetic support, can balanced interaction be attained and maintained. Only while an organism is, and continues to be, in such a state of harmonious integration can it be expected that nutrient fluids and cells can be sent where or when they are most needed, or can any curative substances, principles, enzymes, sera, and the like, be distributed promptly and do perfect work.

Such helpful agencies are available and efficient. At least it is necessary to concede the efficacy of these accessory or supplemental, indeed these essential instrumentalities, and to give to them the same critical study, also to grant them the same confidence when demonstrated or proven, as is now so freely accorded to pharmacodynamic agencies. Consider, in this connection, the significance of the biological law that protoplasm tends persistently and unerringly (unless thwarted by excess stimulation) to come back to the original state as soon as the stimulus ceases.

This reaction to stimulation can be secured almost indefinitely, short of exhausting the governing reflex or reflexes, or the controlling centres. Also it obtains that no destruction of cells follows upon a mechanical stimulus, whereas, on the contrary, after stimulation by a chemical agency there invariably follows more or less change in the cells or fluids or structures. Whether sera, vaccines or other bacteriogenic agencies produce chemical or mechanical changes I do not know. These substances come close to being foods. Thus the supplemental power, perhaps superiority of kinetogenic agencies, modalities of motion, or mechanical stimuli to function are made clear. At least they are wholly safe.

The point to be determined by research in this domain is: How far can present biokinetic measures be relied on and how far can they yet come to be developed? Meanwhile the pertinent query is: How far can the effects of serogenic remedies be influenced, expedited or enhanced through biokinetic instrumentalities?

Obviously their distribution can be materially expedited and hence their effects amplified, at least through enhanced solution, absorption and distribution, thus inviting antibodies to remote parts when materials are introduced into the blood currents.

Let me cite here and later from Sir Almroth E. Wright's address (2): "Therapeutic inoculation can be approached also from a point of view different from that taken up by Pasteur. With respect to immunizing response, the body has been visualized as a single and undivided unit. That is clearly erroneous. One region of the body may be making immunizing response while the other is inactive. For instance, in the stage of incubation it is presumably only the region which is actually harboring the microbe and in the stage of generalized infection it is presumably the entire body which is incited to respond. And again, in localized infections we may—making here some reserves—assume that we have only localized response.

THE DEFENSIVE MECHANISM OF THE BODY.

"To combat bacterial infection the organism must have defensive powers. That power of guarding itself against infection we may call phylactic power. The leucocytes and the bacteriotropic substances in the blood fluids we may call phylactic agents. There is required also efficient staff work to bring your defensive force to the point attacked. The self same thing applies to the body. You must have not only phylactic power in the blood, but also provision for the transport of your leucocytes and bacteriotropic blood fluids to the site of infection. Let me call this transport of phylactic agents to the site of infection, kataphylaxis. Let me term any condition which interferes with that transport an antikataphylactic influence.

"When in sound physiological condition, we have efficient kataphylactic arrangements—blood fluid and leucocytes have unrestricted access to every portion of the body. But when antikataphylactic influences are brought to bear; when the arterial supply is uninterrupted or is closed down by collapse, or the body is petrified by cold, and the alkalinity of the lymph is blunted off by acid metabolites derived from the muscles; then the emigration of leucocytes is arrested, and the transport of blood fluids into the tissues comes to a standstill.

ECPHYLAXIS.

"I drew attention twenty years ago to the terms 'regions of diminished bacteriotropic pressure,' 'non-bacteriotropic niduses,' and nonbacteriotropic envelopes.' These terms have not proved effective missionaries of the idea, and I would propose now to try to put into currency instead the terms ephyllaxis, ephyllactic region and ephyllactic envelope. When I speak of an ephyllactic region you will understand me to mean a region in which the guardian elements of the blood have been rendered impotent or, as the case may be, have been excluded. In describing the effects produced by the abolition or suspension of the circulation by injury to the blood vessels or exposure to cold, I was picturing to you an ephyllactic region. Much more commonly the ephyllactic region has been fabricated by a bacterial colony. You will appreciate that every living bacterial colony must become the centre of an ephyllactic sphere. It will become so, a, by radiating out toxins which will (when of sufficient strength) repel leucocytes; b, by absorbing bacteriotropic substances from the blood fluids; and probably, c, by abstracting antitryptic power from the blood fluids and so converting these into a congenial culture medium."

HOW CAN WE PROFITABLY CONTROL BLOOD PRESSURE AND LYMPH PROPULSION?

As supplemental measures for enhancing the effects of bacteriotropic or serotropic or pharmacotropic remedies, we may mention: Thermogenic, various modalities of heat and cold, the balancing of temperature conditions whereby various expeditive or retardative effects are wrought on cellular activities, on phylaxis, kataphylaxis, antiphylaxis, also ephyllaxis, apophylaxis and ephyllaxis.

As Wright says the kataphylactic measures include evacuation of an ephyllactic focus; also nor-

mal conditions may be restored by augmentation of the transudation of lymph into the focus of infection and displacing and expelling by this agency the ephyllactic lymph; also by restoring physiological conditions by processes of diffusion. Let me quote Wright's recommendations:

KATAPHYLACTIC MEASURES.

"Normal conditions may be restored by augmenting the transudation of lymph into the focus of infection, and displacing and expelling by this agency the ephyllactic lymph. Physiological conditions may be restored by processes of single diffusion.

"1. *Procedures for evacuating the ephyllactic fluid into the exterior.*

a. Incision into the focus of infection.

b. Incision and cupping. In actual practice the method fails, when, as in carbuncle, we have to deal with lymph spaces blocked with leucocytes and coagulated exudate.

c. Application of hypertonic salt solution to naked tissue surfaces.

d. Application of irritant solutions to naked tissue surfaces. An outpouring of lymph.

"2. *Procedures for restoring normal conditions by augmenting transudation from the blood and displacing and driving out the ephyllactic fluid from the focus of infection.*

"Under this heading may be enumerated three procedures: the application of hot fomentations, the application of a Bier's bandage, and massage. In the first two we make use of increased transudation—obtaining that increased transudation in the one case by active and in the other by passive congestion. In massage we use mechanical propulsion. It will generally be inapplicable to an active focus of infection.

"3. *Procedures for restoring physiological conditions in the focus of infection by spontaneous diffusion of protective substances from the blood.*

"If we had under Socratic cross examination the man who expects benefit indiscriminately from every therapeutic inoculation it would be elicited that he had a confused expectation that the protective substance obtained by inoculation would diffuse into, and do effective work in, every focus of infection. In the case of a focus which has attained a certain magnitude that cannot by any possibility happen, for the infecting microbes are incessantly obstructing the work of immunization. They are continuously paralyzing and repelling the leucocytes and depraving the blood fluid to their advantage, and thus they neutralize and more than neutralize the instreaming protective substances. We get as good as no success from therapeutic inoculations when dealing with large and unopened foci of infection; and our very best when as in prophylactic inoculation, we are dealing with infecting microbes before they have had time to fabricate round themselves an ephyllactic focus.

"Of such dominating importance is efficient kataphylaxis in the conflict with bacterial disease that I do not hesitate to assert—and these are views with which every surgeon will fall in—that if we were to put our election, on the one hand, between efficient

epiphylaxis without kataphylaxis; and, on the other hand, efficient kataphylaxis without epiphylaxis, we ought every time to choose the latter."

In a paper read before the American Clinical and Climatological Association (3) I reviewed the subject carefully.

Let me here remark upon the topic of massage or better manipulative procedures in this connection. The profession has by no means directed its attention adequately to the resources of manipulation. Ancient error, prejudices and queer preferential limitations still prevail. What are the contraindications to massage which are still believed to obtain?

Among the more unfortunate dicta which demand revision are: 1, Not to apply massage to a patient in whom fever is present. On the contrary this is often most necessary, since by gentle strokes, light touches, as Menell has shown, extraordinary results can often be obtained in relaxing local or general vasomotor overtension.

2, To avoid massage in the vicinity of wounds, devitalized, injured or infected areas, structures, etc., also where diseases of the skin exist, such as eczema. The fact is that the application of massage to contiguous areas is often followed by prompt repair, cure or pronounced advantage.

3. To avoid massage where the heat making (thermogenic) mechanisms are overborne. Here it is demonstrated that massage affords one of the most efficacious means of restoration. This effect of restoring equipoise in the heat generating mechanisms is peculiarly valuable, notably in conditions of lymph stasis, when subdermal adhesions are present, and the like.

REPUTABLE INFERENCES.

The evidence in behalf of the efficacy of kinetogenic instrumentalities as contrasted with pharmacogenic and to meet diversified emergencies is steadily growing. It demands openminded attention and confidence. Heretofore serogenic remedies when applied have been relied on to suffice alone. Now evidence is accumulating to the effect that these can also be enhanced by—may indeed often demand supplementing by—the kinetogenic. By common consent of surgeons who have actually worked under Willems in Belgium, he has made the largest contribution to surgery of the war in his method of treating acute septic arthritis and traumatic arthritis by compelling volitional effort from the start.

I may cite a personal communication to Dr. S. Fosdick Jones, of Denver, Col., who worked under Willems to this effect. So also of the work of Dr. La Panne at the *Ambulance de L'Ocean*, in preserving function in amputations. Further clinical evidence is needed but here we have indicated most promising accessory measures.

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HOW TO PROTECT THE HEALTH OF SCHOOL CHILDREN*

By IRA S. WILE, M. D.,
New York.

While foreign nations are grappling with the problem of repopulation, the United States is busily concerned with the questions involved in conserving the existing generation and in improving the chances of survival of those still unborn. Public health measures of the past decade have shown a material advance in the direction of efforts to protect the health of school children. In the evolution of this work, more attention has been bestowed upon children during the school age than at any other period of child life, save infancy.

As a matter of logic, devoting attention to children during the school age represents merely an entering wedge into work with children. Because of the glaring handicaps and defects noted in the school population, rationally, the protection of health during the school period should be begun before entrance upon school work. In other words, the potential school child presents a more important problem for public health work and, in consequence, every effort should be made to supervise, control and impart the necessary hygienic information concerning childhood during the first six years of life. Any system of public health may be said to be caring for children inadequately, unless its efforts are directed along lines of prenatal work, the organization of infant welfare stations and the continuous care of children during the preschool age.

For this reason I emphasize the necessity of guiding childlife from conception to the age of six years, as a prerequisite or rather a fundamental part of hygienic protection of the school child.

The purpose of education is thwarted or handicapped when the pupil is physically or mentally incapacitated to receive an education or indeed to develop its latent potentialities. The reports of medical inspectors, indicating the numerous defects and handicaps of school children, bear witness to our failure properly to prepare children for the educational system. The recognition of defective nutrition, carious teeth, impaired vision and hearing, spinal curvatures, pathologically enlarged tonsils and adenoids certainly merits attention during the preschool period. The postponement of attention to handicaps of this type until school work has been begun is indicative of a failure to appreciate the necessity for entering children into school work, capable of functioning in as nearly a normal manner as is humanly possible in the present state of our knowledge.

Economically and socially it is distinctly advantageous to spread some of the attention now bestowed upon the school epoch over the period of life antedating the school age. It is simpler and cheaper to undertake protective measures at the time suggested than to wait until there are additional charges to the community through wastage due to the loss of time, because of preventable diseases or corrective measures.

* Read before the Child Health Conference at Asbury Park, N. J., June 12, 1920.

The protection of the health of school children must take cognizance of more factors than are ordinarily considered. The physical bases of health have received considerable attention but insufficient thought has been devoted to the matter of educational, social and moral factors involved in the health of school children. Our sphere of influence must be enlarged in conformity with the concept of the unity of childhood and the interrelations and interdependence of all factors affecting health. No longer is public health work restricted to the consideration of contagious diseases and personal handicaps. It now contemplates the broader horizon of health, as covering mental and moral wellbeing, and thus influences methods of administrative procedure.

From the more traditional point of view, conserving the health of school children involves the recognition and correction of the existent defects and handicaps and the establishment of methods tending to prevent the development of such obstacles to normal development during the school period. Obviously, if a large part of this work is performed before entrance into school, there will be less of the corrective work to be done during the school period. The need would still exist for the complete examination of new pupils along present lines with a view to determining their physical status and improving upon it.

The regular procedure involved in medical inspection for the prevention of contagion and the control of children during the existence of epidemics is of inestimable importance. The mere tabulation of statistics, however, is without service to the state, save in so far as it indicates the problems to be attacked. Correction of defects is the only excuse for efforts at detection.

Every system of medical inspection requires for complete usefulness a followup system which will insure a full measure of attention for every child found to be physically handicapped. In this connection, of course, the school nurse is a necessity, while a great deal could also be accomplished through the home and school visitor, discussions before mothers' clubs with voluntary committees, willing and able to assist the medical inspectors in carrying out their program.

The importance of dental disorders has now been recognized so that an inclusive health program merits the assistance of dental hygienists and dentists. This phase of dental hygiene, though fully appreciated for several years, has not received the attention it deserves. The haphazard service given the mouths of children during the preschool age has deluged the schools with children whose dental state is lamentable.

I am firmly convinced that in the expansion of state oversight of school children, more use will be made of school clinics, which will serve as the rallying point for health centres, now growing in favor. These school clinics may merely serve as clearing houses or under careful management may offer adequate instruction to care for a large proportion of the conditions requiring continuous direction and control. This is particularly true of health classes which are established for the purpose of

alleviating malnutrition, postural defects, unclean mouths, etc. I believe also that more attention is required to the physical welfare of teachers. The means to be employed must necessarily vary according to the regulations for admission to the educational system, and in consequence I hesitate to suggest a definite program, though the reason for one is apparent.

The problems of physical sanitation, involving light, heat, ventilation, adjustable furniture, the use of water, towels and toilets, are sufficiently important to be given consideration in any large plan involving the complete protection of the health of school children. In addition to these questions, largely taken care of by departments of education, there offers a broader educational field which is of interest from the viewpoint of public health. I refer specifically to the need for special classes for cripples, the blind and the deaf, as well as provision for open air classes for children, anemic, or convalescing from intermittent diseases and children in the pretuberculous or incipient tuberculous stage. Furthermore, there is a necessity for classes aiming to conserve vision, particularly for myopics, and likewise the institution of methods for the prevention and the correction of speech defects. All of these classes while ordinarily regarded as parts in an educational system, in the same way as are the ungraded classes, by reason of the conditions calling for their existence, are also classes possessing a value protective to the health of school children.

They are designed not merely to give special attention to the education of handicapped children, but to do so without sacrifice of greater vitality and indeed with a desire to supplement and increase their latent physical powers and development. From the health viewpoint, as well as the social point of view, the serving of school lunches must not be forgotten, though the underlying basis of this need is found in the ignorance of dietetic requirements, slightly complicated by inadequate family incomes.

It is unnecessary to dwell upon the interrelation of physical and mental causes in the health of school children. The aim of public health work with children is not merely in the value of physical health to the individual, but lies in the worth of efficient citizenship. Patently, this involves mental health as well as physical wellbeing. For this reason the mental health of the school child merits protection. The amount of interest which has been manifested in children of low mentality should be given the entire school population. Those children whose social and economic returns to the state will be of greatest value deserve as high a degree of mental protection as those whose greatest return will be a low limit of self support or those who possibly will require institutional segregation. Under a rational system, every child in school would receive a psychological test with the determination of its intelligence quotient as one of the factors in determining its school adjustment. The child capable of doing work of the third year should not be obliged to mark time in the first year class, because it is chronologically six years of age, and thus begin the formation of habits and conduct

harmful to its mental development. The growth of the mental hygiene movement bears witness to the importance of undertaking some new program in connection with children of the school age. There is a great need for proper school adjustments, the development of rapid advancement classes, and the giving of thought to the bright children just as is now given to morons and imbeciles. Pedagogical discrimination forms an important part of mental hygiene, but the urging of health authorities would be useful in hastening the advance of the educational aids in promoting mental health.

Nature has been kind to children in that it has provided certain natural barriers preventing over study and overwork in school. Nevertheless, there is a growing demand for greater elasticity in school curricula, a longer school year, promotion by subject, and a more careful distribution of work, study and play in school life. I mention these phases of educational work, because health departments and bureaus of child hygiene can find a greater field for the expression of opinions concerning the improvement of health and for giving wise counsel to school children through a higher degree of cooperation with educational systems. It seems irrational to establish clinics of mental hygiene, without at the same time entering upon a campaign to safeguard growing generations against mental disabilities due to faulty school methods.

From the same point of view, the protection of school children involves more knowledge concerning the hygiene of teaching, the proper adjustment of school hours, particularly during the first few years, the balance of recreation, the advantages, methods and dangers of physical education. Many groups of children suffering from such handicaps as cardiac diseases, tuberculosis, crippling, flat feet, deformities of the spine and similar conditions demand the adjustment of school program, and this should be a concern of health authorities.

It must be obvious that no scheme of protecting the health of school children would be complete without at least mentioning the importance of teaching hygiene in its widest implications, not merely as an isolated subject, but as part of every subject with which it has correlation. The institution of events in educational circles under the stimulus of health departments, such as Babies' Week, Clean Up Week, No Accident Week, Health Day, etc., possesses a value from the topical viewpoint but does not suffice to fix the facts of hygiene as firmly as does the proper daily instruction of hygiene in connection with history, civics, geography, nature study, physical education, and indeed English and art, domestic science and manual training. The educational machinery which has revolutionized public health work for childhood, should possess an adequate place in the schools that there may be understanding of the human body in its relations to individual, family and civic health.

One more phase of our general scheme must be considered. The moral factors of health require more attention than the past has offered. The great truths and the underlying purpose of sex education must be imparted to children naturally and rationally, utilizing the home, the school,

the Sunday school, the clinic and the class room as occasion arises. The vast importance of mal-adjustments of conduct and behavior, and the complexes that distort personalities are not to be overlooked, in a complete organization of activities to protect the health of school children. This is merely a suggestion, because it would involve too long a period of time to give it adequate discussion.

I have endeavored to present briefly, though it may not appear so, my conception of the field of work that must be entered in order to give due consideration to the important elements entering into the health of school children. Laying greatest emphasis upon the organization of health work during the prenatal period, infancy and the pre-school age, I should continue every line of endeavor thus begun, permitting them to expand in the directions that child nature develops. The physical, mental and moral phases of child health require guidance, support, constructive suggestion and remedial efforts. These indicate a large variety of functions to be consolidated and coordinated. On this broad principle I believe it will be possible to build up a type of work that will lead to a complete system of health protection for school children. With such a plan and an adequate organization the future will find the nation richer in man power and woman power and with a greater confidence in the healthful development of the future generations.

264 WEST SEVENTY-THIRD STREET.

BACKACHE FROM THE VIEWPOINT OF THE GENERAL SURGEON.*

BY MOSES BEHREND, M. D.,
Philadelphia.

In a symposium of this character the general surgeon has to some extent an advantage over the gynecologist, the orthopedist, and the urologist, provided he received his training before the various branches of surgery were specialized as they are now. Theoretically, we can divide the back into the gynecological, the orthopedic, the neurological, the medical, and the surgical back. The surgical back refers especially to injuries which may result in a fracture of one or more spinal vertebræ and to injuries in the loin space, especially the kidneys. Injuries to the body of the vertebræ are the most difficult to treat and at the same time often the most benign. Fractures of the spine as a result of a crushing injury may disintegrate the cord to such an extent as to cause permanent paralysis or death in a comparatively short time. Backache resulting from these injuries varies to a great degree. It persists in some cases for a lifetime, especially when the injury has not been severe. There is another type of case in which the patient recovers after a favorable settlement has been made, either in court or out.

Injuries to the back may also occasionally cause traumatic inguinal hernia. I have seen two such cases resulting from severe blows on the back, the

*Read at a meeting of the Northern Medical Association of Philadelphia, May 14, 1920, as part of a symposium on backache.

hernia being of a direct inguinal variety. The patient operated upon most recently gave a history of having received a blow on the back while lifting a case of glass from a wagon. There was no history of a previous hernia and at operation there was no preformed sac. The patient was brought into the hospital with the hernia irreducible immediately after the accident. It is well known that a large hernia often causes backache on account of the attachment of the mesentery to the spinal column. The dragging of a large scrotal or vulvar hernia would necessarily give rise to some discomfort in the back, especially if adhesions were present, and very often this was the case in old irreducible hernias.

The appendix must not be forgotten in considering a subject so important as backache. We all know that an acutely inflamed appendix often gives rise to pain in the loin space, especially where the appendix is posterior to the cecum and pointing in the direction of the gallbladder. The character of incision will often depend on the diagnosis of an appendix in this position. In chronic cases, where the appendix is tightly bound down to the cecum and the peritoneum, backache is often a symptom of this condition. Only recently a patient was admitted to the hospital in whom we diagnosed right tuboovarian disease and retroversion. On opening the abdomen the pelvic organs were found to be practically normal but a chronic appendicitis existed in which the tip of the appendix pointed in the direction of the gallbladder.

At times grave disease in the loin space, such as retroperitoneal sarcoma may be retroactive, namely, in the early stages of its growth pain may be referred to the anterior portion of the abdomen instead of to the back. This I believe is found only in the early stages of the disease. As an illustration of this point I should like to cite the case of a young boy who had all the symptoms of chronic appendicitis, this diagnosis having been made by a reputable internist and myself. The appendix was removed and the youth left the hospital in a short time. About eight weeks after the operation he complained of backache, for which no assignable cause could be found. A late infection of the wound was thought of but this idea had to be discarded when shortly afterward a swelling was found in the loin space rather high up under the border of the ribs. We operated again on account of the swelling and intense backache and notwithstanding all the well recognized treatments, such as Coley's fluid, radium and the x ray, the boy died complaining persistently of the most intense backache.

Dr. Hirsch has alluded to stones in the kidney as a cause of backache. It is difficult to separate the consideration of gallstone from that of kidney stone. When these symptoms occur on the right side there may exist some doubt as to the proper organ involved but one must bear in mind that colic from stone in the kidney starts in the back and then radiates down the front of the abdomen, while in gallstone disease the pain usually starts in front and then may radiate to the back, even to the shoulders. The character of the pain from these sources may be quite alike, bor-

ing or knifelike in character, or, as one patient described it, as though some one was taking his five fingers and trying to dig a hole through to the back. There may be silent stones in the gallbladder similar to those in the kidney, but when old gallbladder disease is present, with obstruction of the cystic duct, there is often a continuous backache, especially after meals. This symptom accompanies the so-called symptoms of indigestion.

Ulcer of the duodenum and ulcer of the stomach on the anterior wall, the lesser curvature, or at the pylorus, rarely give rise to backache, but ulcers on the posterior wall of the stomach, especially those adherent to the pancreas and even to the parietal peritoneum, may cause backache burning in character. Recently I have operated in several of these the cases of ulcer on the posterior wall of the stomach. The same may be true of cancer of the stomach in its early stages, backache not being a prominent symptom until adhesions occur between the pancreas, the stomach, and other organs.

Syphilis when it affects the liver may give rise to a continual dragging sensation in the back. This refers especially to the massive liver that accompanies some cases of syphilis. To illustrate this point I will cite the case of a patient with a large, soft swelling in the abdomen, who was admitted to the hospital. Many diagnoses were made because the Wassermann reaction was negative. At operation the liver was found to extend from the diaphragm to the os pubis, hiding entirely from view the coils of the intestine. A section of liver was taken for histological study and another Wassermann was obtained because we were not satisfied with the result of the first Wassermann, which was not made in the hospital. The second Wassermann was positive and the histological study confirmed the diagnosis.

1427 NORTH BROAD STREET.

MEDICAL MEN IN THE AMERICAN REVOLUTION.

The New York Campaign of 1776.

BY LOUIS C. DUNCAN, M. D.,

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(Continued from page 349)

THE MEMORIAL OF THE REGIMENTAL SURGEONS TO
CONGRESS.

This sets forth that when troops were assembled in haste, at the first breaking out of war, regimental surgeons were appointed to accompany them, provided with medicine chests, from the different parts of the country, where they were raised, at Colonial expense. That when it became a common cause of the whole continent, and provision was made, by Congress, for the care of the sick and wounded of the Army, by the establishment of a general hospital, with a Director General, four surgeons and twenty mates, there was no mention of the regular surgeons and mates, nor any provision made for them, either of medicines, instruments, or other

necessaries; yet they were kept in pay. That, in this situation, it might be presumed the hospital surgeons and mates, appointed to take care of the sick and wounded, were scarcely sufficient to attend so great a number of patients as an unhealthy season, or an active campaign might produce; yet the regimental surgeons and mates, for want of a suitable provision, must in their present situation, be very useless; although they were so much more numerous than the hospital surgeons and mates, and always professed an ardent desire of being properly employed, and of answering the design of their appointment. That not knowing where else to look for relief, they had applied to the director general, who assured them of his inclination to serve them; but having no orders to issue out supplies to them, and it being unusual for regimental surgeons to depend upon the General Hospital for all they wanted, he had advised them to make application of the Commander in Chief, or Congress, for establishing a proper method to obtain supplies, promising to second their applications, with the warmest representations from himself. That it was with his advice, the present memorial was drawn up, to lay before Congress. That he had given them several meetings, and a set of proposals were agreed upon, as regulations, provided they met with the approbation of Congress, which were enclosed for consideration; praying for such relief on the premises, as to the wisdom of Congress should seem meet.

The proposed plans will be found in the appendix to this chapter (4).

In July he also sent Dr. Binney to Philadelphia to procure medicines and instruments. Binney wrote him that no instruments were to be had; that the only instrument makers in the city were employed by Mr. Marshall for the Congress. Dr. Binney at length (August 15th) sent forward such a supply of medicine as he could procure, and they arrived at Newark a short time before the retreat from New York. This was a fortunate accident, for they served the hospital established in Newark about that time.

The Director General forwarded the various documents to Congress, together with a long letter of explanation addressed to Samuel Adams, Esquire, and the rest of the medical committee. He stated their troubles, dwelt on the great shortage of supplies with the regimental surgeons, and implored that he be clothed with authority and definite orders. He also referred to the great distress of the army in Canada and enclosed a plan observed by the British in conducting their general and regimental hospitals. He closed with this request:

(6) I beg instruments may be sent us, particularly amputating; crooked needles and sponges. The enemy are at hand; the campaign is opening; I have done all my limited power will allow. I hope, though late, almost too late, that it is not altogether so, either to receive power, instructions, or means to regulate the affairs of my Dept. I have done my duty in giving the necessary information for what is connected with it, and preparing for the faithful discharge of my trust. I now rest the matter on your determinations, being, with all possible regard,

Gentlemen,

Your most dutiful and obedient servant,

JOHN MORGAN.

Congress was busy with many things then, but Morgan's regulations were mainly approved. The

only letter received from Adams was one of August 5th, in which he said:

I have received several letters from you, which I should sooner have acknowledged, if I could have found leisure. I took however, the necessary steps to have what you requested effected in Congress.

Congress had acted on July 17th (5) and complied with most of Morgan's recommendations; practically all, in fact.

This resolution, or law, was on the whole in accordance with the ideas of Morgan, and very nearly abolished regimental hospitals—in law, but not in fact. They continued as before. It put all surgeons, hospital and regimental, on the same level in so far as rank was concerned. It established a system of property returns, and reports of the sick, as well as of personnel. It displays the usual thoughtlessness with which those in authority direct the preparing of endless papers by those under them. It was the answer to Morgan's proposals, and should have been reasonably satisfactory to him. It was not at all satisfactory to the regimental surgeons, who were required to abandon any real hospitals, and apply elsewhere for all supplies except medicines and instruments. They then renewed, with increased vigor, their efforts to undermine Morgan's standing with the Congress. In this work they were soon joined by the Medical Director of the Flying Camp, Dr. William Shippen. Dr. Morgan then obtained permission to go to Philadelphia and lay the case before Congress. He learned that Congress had purchased a valuable stock of medicines that were in the hands of druggists there. As sales had been made from this stock, and considerable quantities sent southward, he feared it might be dissipated, though it was the best collection of medicines that he had ever seen in the American Army.

While on principle opposed to supplying the regiments, he offered to take a portion and supply chests to the regiments at New York, for one year, as an experiment. He says, "I did not conceive that there would be more than forty or fifty regiments assembled at New York; nor did I suppose that half of them would come destitute of medicines and chirurgical apparatus, when I heard that the Southward (Southern) regiments were supplied by the Continental Druggists. I supplied from forty to fifty regiments with medicine chests by the end of August; besides all the branches of the General Hospital at New York, in the Bowery and neighborhood and on Long Island; which reduced many of our capital articles to an insufficiency for the general hospital for the remaining part of the campaign."

For the purpose of supplying the hospitals and regiments, Congress authorized a continental druggist at Philadelphia, on August 20, and elected to that position Dr. William Smith (6). This continental druggist acted as a medical supply officer.

The Medical Department of the Continental Army at this time was modeled after that of the British Army. It consisted of the general hospital, under the personal direction of the medical director, and regimental hospitals, maintained by the regimental surgeons. The general hospital, at first a single in-

stitution, had necessarily been divided and branches of it instituted, at Fort George, Boston and other places. It was served by hospital surgeons, mates, and hired cooks, nurses, etc. These latter were paid from fifty cents to one dollar—not per day but per month. The general hospital was located in large public buildings when possible; otherwise in churches, warehouses, private homes and barns. The value of the ration due the sick was drawn in money. A principal article of the hospital stores then purchased was rum. Some sort of beds and bedding were furnished, but it was customary to put two men (or more) in one bed. It is not strange that hospital fever (typhus) prevailed.

The entity termed a regimental hospital was no hospital in any definite sense of the word. It was merely a collection of the sick of a regiment, in some house, barn or other building. There were no beds or other facilities. Each man brought his own blanket, which was spread on straw. Each drew the ordinary rations; hard bread, salt beef or pork, and a tot of rum. The British regimental hospitals were little better. Dr. Robert Jackson, acting surgeon's mate of the 71st Regiment (Fraser's Highlanders) says that his regimental hospital at King's Bridge was a turf hut. Jackson was afterward captured at the Cowpens on account of having generously given his horse to Tarleton. Having no dressings for the wounded he took off his own shirt and tore it in strips for that purpose. Whatever may have been the effect of this action on the wounded, it so impressed General Morgan that Jackson was soon sent back to the British Army, without exchange. He was captured a second time at Yorktown. He was one of the first surgeons of the British Army to secure commutation of rations for the sick in regimental hospitals.

This system of regimental and general hospitals obtained in both armies for a hundred years. The functionary known as a surgeon's mate was, in both armies, a warrant officer, not commissioned. Later, in the Continental Army the mates received a status somewhat approximating commissioned rank. Dr. Jackson, while performing the duties of a regimental surgeon's mate, was carried on the muster and payrolls as an ensign, which gave him more nearly the rank of an officer.

The controversy between the Director and the regimental surgeons never ceased. They not only refused to report to him but even had the audacity to seize for regimental hospitals the very houses assigned to him for a general hospital by the State of New York. A sample of Morgan's troubles throws light on the various so-called army hospitals of that time. General Fellows' Massachusetts Brigade was stationed along the North River from Greenwich to Chelsea, to defend that line. Morgan rode out with Quartermaster General Moylan to view the sick and the houses where they were quartered. They found one house so crowded with sick that he remonstrated with the responsible regimental surgeon. He says:

On looking into the rooms, they were found to be filled with sick, and the surgeons who had their care, panting for breath, in the midst of them. It was amidst the sultry heat of summer. In vain I represented to him the danger of engendering a putrid, malignant fever, from

crowding so many sick in confined rooms, in that hot season. He had near a hundred sick in the house. I forbade him then, as I had uniformly prohibited every regimental surgeon, from taking charge of more than thirty or forty sick. I recommended to him to send at least one half of his sick to the general hospital, and remove the greater part of his men into the barn. He disregarded my advice, a putrid fever prevailed, he caught the infection and paid the forfeit of his rashness with his life.

The general orders at this time allowed regimental hospitals, under certain restrictions which were seldom observed. In this case Morgan applied to General Heath, but got no satisfaction. He remonstrated with the colonels commanding, but they refused to compel the regimental surgeons either to report to the Director, or send their sick to the general hospital. The colonel of this particular regiment said that if in his power to prevent it, none of his men should ever be carried to a general hospital. When the Director ordered bed frames made, as fast as forty or fifty were made the regimental surgeons carried them off, some two thousand in all. Such were the difficulties of the hospital surgeons that both Dr. John Warren and Dr. Isaac Foster asked to resign and were only prevented from doing so by Morgan. The particularly aggravating thing in the whole affair was that the regimental surgeons were continually writing to members of Congress: an old complaint, not yet entirely cured.

Lord Howe arrived in the Bay on June 29th with a fleet and eight thousand soldiers. The prospects of the colonists were dismal. The Northern Army, defeated and discouraged, was making its way back to Crown Point by slow and painful degrees, sickness and starvation vying with each other in the work of destruction. In every tent there was a sick or dying man. From thirty to forty were buried each day.

Adjutant General Reed wrote, "Had I known the true picture of affairs, no consideration would have tempted me to have taken an active part in this scene: and this sentiment is universal."

Early in June General Clinton arrived from the South with some eight thousand more men; and on the 12th of August still another fleet arrived, with the first of the Hessians, seven thousand eight hundred; men from Bunswick and Hesse Cassell, for whom King George had bargained to pay thirty-four dollars and fifty cents for every one killed, and to count three wounded as one dead. General De Heister commanded this contingent. The calculation as to wounded may well have been based on the experience of the time.

The combined fleet now consisted of thirty-seven men of war and four hundred transports; with an army of twenty-seven thousand men. This was the largest British force ever concentrated in America. The troops were landed on Staten Island. All were well organized, splendidly equipped, and in every way fit and sufficient to have effected their purpose, had they been ably led.

Washington had on August 8th about seventeen thousand men, of whom part were militia, and three thousand seven hundred were unfit for duty, sick. The urgency of the situation brought in more militia, more new men. Of the whole army not six thou-

sand had been in the army a year. The constant coming and going made discipline impossible. Not a single regiment was properly equipped. There were not enough muskets to go around, and many of them were useless. The cannon were small and poor, and without skilled gunners. Knox, the artillery commander, was but recently from his Boston bookshop. General Sullivan had been a lawyer. Lord Stirling's experience had been limited. Putnam's only tactics were to fight. Greene was the most cautious and skillful of the subordinate commanders, but unfortunately he fell sick of a raging fever a few days before the battle (7). The command fell to Putnam, who had little or no knowledge of the ground, and, it must be confessed, was no general.

On August 22nd the British troops on Staten Island began to cross to Long Island in boats, and by noon fifteen thousand men had landed near where Fort Hamilton now stands, with forty pieces of artillery. The force moved to Flatbush and Flatland. Washington hurried over reinforcements and did his best to inspire them with courage, but it was clear that the morale of the troops was low. A shadow seemed brooding over this new army, now about to undergo its first great pitched battle: for it was outnumbered nearly three to one, by a better army; destined to be completely outgeneraled; and to be sacrificed to no good purpose.

The battle, now more certainly anticipated, induced Dr. Morgan to provide more complete hospital facilities. He went before the New York Convention to appeal for buildings to be used as hospitals for the wounded (8). A certain number of houses were ordered turned over to him, and now, with his surgeons instructed, supplies prepared, and hospitals waiting, he may have felt in some measure prepared for the coming battle.

General Greene had intrenched a strong camp, protected by Wallabout Bay on the left and by Gowanus Bay and a creek running into it, on the right. This line was less than a mile and a half long and was strongly fortified—so much so that the British hesitated to attack it after the battle. It was, however, resolved first to defend the line of wooded hills, some two miles in front of the camp, extending from the narrows eastward toward Jamaica. There were four passes through these hills. Greene planned that all should be guarded, and Washington ordered it; but on the day of battle Bedford Pass was left almost unguarded, and Jamaica Pass, farthest east, was without defense. It has been well said that through the latter Pass "marched the Nemesis which dogs the feet of carelessness."

Lord Stirling with five small regiments held the right of the line, next the water. Sullivan with five regiments held the centre, now Prospect Park, Brooklyn (9). A few regiments remained in the fortified lines. At most five thousand were along the line of hills, facing at least four times as many British and Hessians (10).

In front of these passes, two defended, were twenty thousand of the best soldiers that England could produce, which were as good as any in the world. In front of Lord Stirling was General

Grant with two brigades, one Highland regiment and two companies of New York Royalists. Stirling met them in what is now Greenwood Cemetery, and imagined that he held them in check; but they were only biding their time. In the Flatbush Pass Sullivan was likewise confronted with the eight thousand Hessians under De Heister. De Heister fired some shots, but, like Grant, did not engage heavily—the time had not come.

During the night Clinton and Cornwallis with seventeen regiments and eighteen guns had made a flanking march to the east, crossed the unguarded Jamaica Pass, and then turned westward. By half-past eight the vanguard was at Bedford Four Corners. Here the spell of silence was broken; the bands struck up, the troops burst into cheers; and, pushing on, by nine o'clock the advance columns rested on the junction of the old Flatbush and Jamaica Roads, now the junction of Flatbush and Atlantic Avenues; only a few rods in front of the inner line of the American fortifications. Then it was that the two heavy guns sounded the preconcerted signal for De Heister to press the attack.

De Heister heard it and ordered Donop to carry the Flatbush Pass. The Hessians swept through the woods, followed by the Grenadiers, driving before them the feeble forces of Henshaw's and Johnston's Massachusetts and New Jersey men, with Hand's Pennsylvania Riflemen. Sullivan heard the signal guns, divined their meaning, and started for the fortified lines. A detachment of the British had marched through the Clove Road and reached the rear of Miles's Pennsylvanians; they were soon in full retreat. These various regiments, driven backward to the northern slopes of Prospect Hill, were suddenly confronted by the bayonets of Clinton and Cornwallis. They were thrown backward and forward between fire and bayonet. The greater part found themselves shut between closing jaws of fire. The retreat became a rout, and a massacre. The Hessians gave no quarter. Men who had thrown away their arms were shot down or bayoneted. For two hours the area now enclosed by Atlantic, Flatbush and Clinton Avenues saw this unequal struggle. More than five hundred perished, a few were made prisoners (Sullivan among them); a few escaped.

It was nearly eleven o'clock when Grant heard the second signal, which was his order to attack. He had just been reinforced by two fresh regiments from the fleet. Pushing rapidly forward, Colonel Atlee and his 235 skirmishers were soon killed or made prisoners. Huntington's Connecticut men fared little better. And now, with the frontal attack, the Hessians came streaming in on Stirling's left and Cornwallis came hurrying down from the rear to seize the old Cortelyou house on his only road of escape. The situation was now frightful, but Stirling kept his head. He saw that if he could not hold back Cornwallis his whole command must suffer death or capture. He resolved on a costly sacrifice. Taking three hundred of Colonel Smallwood's Maryland Line, he ordered all the remainder of his troops to retreat across the marsh and creeks of Gowanus Bay to the intrenched lines. The rising tide made this more difficult each minute.

Taking his place at the head of the three hundred, all of them boys, he led them straight at the British, posted in the Cortelyou house with two guns; while the Hessians held the adjoining hills. The terrible fire drove them back. But his men were not yet safe. Again he rallied them and led them on this forlorn hope; this time to the house, where for a moment they held the guns. Again and again this little band was led forward. After the fifth rally there were too few for another charge, but it was not needed. The sacrifice had accomplished its end. Stirling's force had escaped. Two hundred and fifty-six of Smallwood's regiment were killed, wounded or missing. A feeble remnant of the regiment struggled across the creek bearing their tattered colors with them. Stirling, an Englishman, rode away across the hills and surrendered to De Heister. Taken on board the fleet, he found Sullivan already there.

The battle was ended before noon. Five thousand men had been surrounded by four times their number. A thousand were captured. Several hundred were killed. General Howe estimated the American loss at three thousand five hundred. It was not that much, but the army was broken up. His own loss he reported as 367 killed, wounded and missing. This was the most discreditable defeat the Continental Army ever experienced, though the men never fought more bravely. Yet it might have been worse. Had General Howe but given the word, his generals, who were eager, would have rushed on the intrenched lines, almost certainly have carried them, and captured the whole American force on Long Island. The loss, some eight thousand men in all, would have ruined the army.

At the close of the day the intrenched camp was filled with the weary, beaten, and dispirited soldiers. Some were wounded, many without arms; all discouraged. Hundreds of the patriotic farmers of the neighborhood had fled to this place of refuge, driving their flocks and herds with them to prevent their capture. Drenching rains filled the trenches with water and added to the general discomfort. A thousand cattle roamed about the camp. But the vague terrors of the night at length gave place to the more definite apprehensions of another day. A thick mist clung to the landscape, concealing the enemy.

During the afternoon two brigades had been brought over. At four in the morning Washington came to cheer and reinforce his shattered forces. He brought Shea's and Hands's Pennsylvania Regiments, and a little later came Glover's Regiment of Marblehead fishermen. There were now nine thousand men in the intrenchments, and Washington at first resolved to hold them. But when the mists cleared away, revealing twenty thousand men in his front, he resolved to retreat. On the night of the 29th the whole force was withdrawn to Manhattan Island. The Pennsylvania regiments of Hand and Shea were crossed first; the Delaware and Maryland regiments formed the rear guard. Glover's regiment handled the boats, and a heavy fog aided the undertaking.

The regimental surgeons had little opportunity to follow Morgan's teaching in this battle. Several were captured. They may have collected the early

wounded behind the hills; but suddenly this line also was attacked, there was no longer any rear. The army broke up and fled. Those wounded able to walk had some chance to escape; the severely wounded were captured and the majority killed. Brigadier General Woodhull of the militia was killed while a prisoner, by De Lancey or some of his Royal Americans. Some of the wounded, however, escaped. All were removed to New York, by order of General Washington, (11) on August 29th, before the evacuation.

NOTES.

1.—John Warren, younger brother of Joseph Warren, was born in Roxbury in 1753. He graduated at Harvard in 1770, studied medicine with his brother, and began the practice of medicine in Salem in 1772, being but nineteen years of age. He attended the wounded at Bunker Hill, and while trying to reach his brother received a bayonet wound. After the battle he was appointed a hospital surgeon, and served in the hospitals about Boston. He accompanied the army to New York, and was, as we have seen, in charge of the hospital on Long Island. Later, he was at Newark and Philadelphia. At Trenton the army marched in the night for Princeton, leaving the surgeons behind. They galloped off, barely escaping capture. In 1777 Warren was made superintendent of hospitals at Boston, and served there until the end of the war. For forty years Dr. Warren occupied a foremost place among the surgeons of New England. In 1785 he was made professor of anatomy and surgery in the newly established medical school of Harvard. He was first president of the Massachusetts Medical Society, and held that position continuously from 1804 until his death in 1815. His son, John Collins Warren, 1778-1856, was a distinguished medical practitioner, teacher and writer.

INSTRUCTIONS TO JOHN WARREN, ESQ., SURGEON OF
THE GENERAL HOSPITAL, WASHINGTON, D. C.

NEW YORK, June 12, 1770.

Sir:

You are desired to go over to Long Island and to consult with General Greene, about the proper houses for the forming of a hospital (to be part of the general hospital) for the reception of the sick in his brigade. For your assistants you will be pleased to take over three of the hospital mates, of which Mr. Glover is to be one, the other two as you agree with the other surgeons.

Make out a proper assortment of medicines, such a list as you think needful, after consulting with Dr. Foster, Dr. Adams and Dr. McKnight, and order it to be put up from the hospital stores. If you have occasion for further assistants, make requisition from General Greene's brigade, of as many surgeons and mates as you shall stand in need of.

Keep a register of the sick, in which you are to make an entry of the times of their admission and discharge, as well as of the diseases they labor under; and require of the respective surgeons of the different regiments, weekly returns of the sick in the hospital belonging to their regiments; in order to compare with yours: From which a roll is to be made out once a month, for receiving the ration money from the commissary general.

What nurses you require for the sick, you will engage at the price of half a dollar per week: the number not to exceed one for every ten persons sick or wounded; the necessary laborers to be employed by the day, as usual, in which avoid engaging a greater number than is absolutely necessary.

Deliver out no stores of any kind to the regimental surgeons. When the sick require further aids than they can give, let them be reported to you, and if their cases require it, receive them into the general hospital. Take with you at least 1,500 bandages, and a quantity of tow, with a set of capital instruments, and all suitable dressings in case of action.

Use your best endeavors to make the surgeons and mates of the regiments attentive to their duty.

For any debts contracted for the use of the general hospital, agreeable to the above rules, draw on me. You will employ the same person to supply fresh meat and at the same prices, as in the hospital at New York.

Weekly returns of the sick to be sent over early every Monday morning as usual.

Be pleased to call on Mr. Delameter for one hundred additional blankets . . . and as many beds: applying to the quartermaster for straw, from time to time, and order the nurses, washerwomen, etc., to clean them from time to time.

An orderly mate is to take charge of the blankets and bedding, etc., and of the hospital furniture every week: to enter into a book for the purpose, what stores of this kind are given out, to examine what each sick (person) brings with them, and to see that nothing is carried out on their dismissal not belonging to them.

An orderly sergeant, or corporal, or careful soldier (if the general will allow) ought to be stationed at the hospital, to take charge of the arms, etc., of the sick, whilst in hospital, and to give them up on his death or dismissal.

A carpenter ought to attend constantly to make coffins, or to perform other work, for which you will apply to the quartermaster general.

No blankets, or other effects of the hospital, to be expended at the funeral of those soldiers who die in the hospital.

I remain, sir, your most humble servant,

JOHN MORGAN.

3.—REGULATIONS proposed by the Director-General of the Hospital; and agreed upon with the Regimental Surgeons, to be laid before CONGRESS for THEIR DETERMINATION upon them.

First.—That regimental surgeons apply to the quartermaster general and obtain from him, or the barrack master, by an order from him, some proper quarters convenient for the situation of each regimental or brigade hospital.

Second.—That said hospitals be furnished from the quartermaster general's department with necessary utensils and hospital furniture, according to a list of enumerated particulars.

Third.—That regimental surgeon be supplied in future by continental druggists, with medicines, instruments and old linen for bandages, and necessary dressings.

Fourth.—That they shall report to director general or surgeons of the general hospital, all such sick pa-

tients of their regiments, who are proper objects; making use of every possible precaution, to guard against crowding in the hospital with putrid cases, that require fresh air for recovery of the sick; lest hospital, malignant, or pestilential diseases be excited, to the great devastation and ruin of the army.

Fifth.—That they make proper reports from said register, to accompany every person they recommend to the general hospital, with an account of the patient's care, and previous treatment, and what clothing is sent with each patient, certified by the surgeon or mate, and signed also by a commissioned officer.

Sixth.—That they make daily returns to quartermaster or adjutant of the regiment; of the sick belonging to that regiment, who are unfit for duty, whether remaining under their own care, or sent to the general hospital, that no soldiers may be exempt from duty, as sick men, that are not borne on the doctor's list; and that no rations be drawn for them, amongst the effective men, whilst they are drawn for with the sick, whether in the general or regimental hospitals.

Seventh.—That they make weekly returns of the sick from their registers, both in the general hospital, and regimental or brigade hospitals, as well to the director general as to the commandant or brigade, that a true state of the sick of the whole army may be made out, to lay before the Commander in Chief, and to be transmitted to Congress, weekly.

Eighth.—That agreeable to the sick list returned to the director general, the regimental surgeons be entitled to draw from the general hospital, for the sick remaining under their care, any articles they may choose, agreeable to the various diet tables made use of for the patients of the general hospital; and whatever other refreshments they choose, with which the general hospital is supplied, to the full amount of their rations. If they require more from the general hospital, the sick are to be sent to the general hospital.

Ninth.—That Colonels of regiments be allowed to draw monies for defraying any extraordinary or incidental charges of regimental hospitals, and for such articles as are not to be got in the stores of the general hospital, nor in the commissariat or quartermaster's department, and on account of the disbursement to be settled, with the weekly or monthly abstract of the regiment.

Tenth.—That the state of the several regimental or brigade hospitals, of the sick, and of the medicine chests, be subjected from time to time to the director general, or such hospital surgeons as he shall appoint to that duty.

Eleventh.—That in all things, not particularly ascertained in these regulations, the usage of the British and other armies be followed, till otherwise directed as far as is consistent with the good of the service.

One is astonished at the completeness of these regulations, the number of details covered. It is evident that they were not evolved at once, but were taken from the regulations and customs of the British Army. Paper work must have existed long before that time. When the term brigade is used here probably it does not refer to a brigade of several

regiments, but to a small force of a few hundred men, termed a brigade rather than a regiment.

4.—ADDRESS TO THE SURGEONS.

I have, with all care and attention in my power, taken into consideration the state of the regimental surgeons, with a view to getting them provided with regimental hospitals, and pointing out the means for their being in future, supplied with the usual requisites, for the more easy, more regular, and more extensive discharge of their duties annexed to their stations. To answer this end, I have considered that it is within our power, as matters now stand, and what we are to aim at, for further improvement; and have, by a train of reflexions on the subject, been led, in the first place, to propose certain regulations, which appear to me to be both salutary and practicable, if they meet with your concurrence, for which I shall submit them to your hearing and strictures, for correction and amendment. If we can agree in them, it will be one step gained, and may serve as a foundation, on which to proceed, in smoothing every difficulty that may still remain, toward forming a more perfect plan, or model of economy, in the conducting of the military hospital, and providing for the sick and wounded.

The next step I apprehend we have to take, is to apply to Congress for an immediate supply of chirological instruments and bandages, for the regimental surgeons, and for its approbation of the proposed regulations, as well that that of the Commander in Chief; that those regulations may have a proper authority to rest upon, for their sanction and support; and 3dly to suggest such others, as may be still more useful, in future, though the continuance of the war may make further regulations necessary.

5.—“On July 17, 1776, Congress took into consideration the report of the Committee on the memorial of the director general of the American hospital, whereupon, Resolved

First.—That the number of hospital surgeons and mates be increased, in proportion to the augmentation of the army, not exceeding one surgeon and five mates to every five thousand men, to be reduced when the army is reduced, or when there is no further occasion for such a number.

Second.—That as many persons be employed in the several hospitals, in the quality of storekeepers, stewards, managers, and nurses, as are necessary for the service, for the time being, to be appointed by the director of the respective hospitals.

Third.—That the regimental chests of medicine and chirological instruments, which are now, or hereafter shall be in the possession of the regimental surgeons, be subject to the inspection and inquiry of the respective directors of hospitals, and the director general, and that the said regimental surgeons shall, from time to time, when thereto required, render account of the said medicines and instruments to the said director, or, if there be no director in any particular department, to the director general; the said accounts to be transmitted to the director general, and by him to the Congress; and the medicines and instruments not needed by any regimental surgeon to be returned, when the regiment is reduced, to the respective directors, and an account

thereof rendered to the director general and by him to Congress.

Fourth.—That the directors of hospitals in the several departments, and the regimental surgeons, where there is no director, shall transmit to the director general regular returns of the number of surgeons and mates and other officers employed under them, their name and pay; also on account of the expenses and furniture of the hospital under their direction; and that the director general make a report of the same from time to time, to the Commander in Chief, and this Congress.

Fifth.—That the regimental and hospital surgeons in the several departments make weekly returns of the sick to the respective directors in their departments.

Sixth.—That no regimental surgeon be allowed to draw upon the hospital of his department for any stores except medicines and instruments; and that when any sick person shall require other stores, they shall be received into said hospital and the rations of the said sick persons be stopped, so long as they are in said hospital, and that the directors of the several hospitals report to the commissary the names of the sick, when received into and when discharged from the hospitals, and made a like return to the board of treasury.

Seventh.—That all extra expense for bandages, old linen, and other articles necessary for the service, incurred by any regimental surgeon, be paid by the director of that department, with the approbation of the commander thereof.

Eighth.—That no more medicines belonging to the contingent be disposed of till further order of Congress.

Ninth.—That the pay of the hospital surgeons be increased to one dollar and two thirds of a dollar by the day; the pay of the hospital mates to one dollar by the day, and the pay of hospital apothecary to one and two thirds of a dollar by the day, and that the hospital surgeons and mates take rank of regimental surgeons and mates.

Tenth.—That the director general and the several directors of hospitals be empowered to purchase, with the approbation of the commanders of the respective departments, medicines and instruments for the use of their respective hospital, and draw upon the paymaster for the same, and make the report of such purchases to Congress.”

Journal of Congress, July 17, 1776.

(To be continued)

LONDON LETTER.

(From Our Own Correspondent)

Red Cross Societies Meeting.—Conference of the Imperial Bureau of Entomology.—Society for the Prevention of Venereal Disease.—Sir John Bland Sutton Retires.

LONDON, July 19, 1920.

The first meeting of the Medical Advisory Board of the League of Red Cross Societies took place on July 5th, when it discussed with the director general, the general medical director, and the chiefs of the medical department of the league the health work to be undertaken by the league. The board is composed of the following experts: Bel-

gium, Professor Bordet, director of the Brussels Pasteur Institute; Denmark, Professor Madsen, director of the Copenhagen State Serum Institute; France, Professor Ronx, director, and Professor Albert Calmette, subdirector of the Paris Pasteur Institute, and Dr. Leon Bernard, professor of hygiene in Paris University; Great Britain, General Lyle Cummins, professor of pathology, London, Sir Walter Fletcher, secretary of the medical research committee, London, Sir George Newman, chief medical officer of the Ministry of Health; Italy, Professor Bastianelli, pathologist to the Rome Polyclinic, and Dr. Castellani, professor of tropical diseases at the London School of Tropical Medicine; Japan, Dr. Kinnosuke Miura, professor at Tokyo University; South America, Dr. Chagas, director of the Oswald Cruz Institute of Rio de Janeiro; United States, Dr. William Welch, director of the School of Hygiene at Johns Hopkins University, Dr. Herman Biggs, Health Commissioner of New York State and Dr. Simon Flexner, director of the Rockefeller Institute.

* * *

Representative entomologists from all parts of the British Empire assembled on Tuesday, June 1st, at a conference arranged by the Imperial Bureau of Entomology, South Kensington. Dr. Guy A. K. Marshall, director of the Imperial Bureau, remarked that the department was inaugurated in 1909 under the name of the Entomological Research Committee, Tropical Africa, by the then Secretary of State for the Colonies, for the purpose of stimulating the study of the numerous insect pests that were retarding the development of tropical Africa, and especially the blood sucking and disease carrying insects. In 1913 its activities were extended to cover the whole of the Empire, its principal functions being to collect and disseminate all the published information relating to injurious insects, to identify insects sent by entomological, medical, and veterinary officers from all parts of the Empire, to distribute entomological specimens required for research or teaching purposes, and generally to render all possible assistance to economic entomologists in the carrying out of their work against injurious insects.

* * *

The first annual meeting of the Society for the Prevention of Venereal Disease was held at the house of the Royal Society of Medicine, 1 Wimpole Street, London, W., on the evening of Thursday June 3d. The president of the Society Lord Wiloughby de Broke was in the chair. In the course of an able speech in which the objects and aims of the society were recapitulated he strongly condemned the "policy of suppression" adopted by the Government in all matters relating to venereal disease and moved a resolution asking that the Ministry of Health should authorize druggists to supply means of selfdisinfection which they are now prevented from doing by act of Parliament. Dr. Saleeby, who seconded the resolution, said he believed that venereal diseases were on the increase despite official statements and explanations. Sir James Crichton Browne supported the resolution in an eloquent speech. Sir William Arbuthnot Lane observed that the society should be called the sui-

cide club, because it was mainly composed of medical men who by preventing the spread of venereal diseases were taking away their own living. Most of the diseases from which the world suffered could be traced to venereal disease. The resolution was carried.

* * *

Sir John Bland Sutton, the well known London surgeon has retired from the active staff of the Middlesex Hospital with which he has been connected for forty-two years. He has been a generous giver to the hospital. He founded and endowed the Bland-Sutton Institute of Pathology. Sir John was recently made the president of the newly formed association of British surgeons. The Board of Governors of the American Hospital in London gave a dinner on July 6th, at which the guest of the evening was Dr. Charles H. Mayo, of Rochester, Minn. Lord Bryce and Lord Reading were the hosts at the dinner.

* * *

It has just been announced that the scheme for providing a memorial to Sir Victor Horsley has now been given a definite start. The nucleus of a committee has been formed, with Sir Charles Ballance as chairman. Sir Frederick Mott and Dr. H. H. Tooth will act as honorary treasurers *pro tem*, and Sir W. Arbuthnot Lane and Edward J. Donville will act as joint secretaries. In a letter contributed to the *British Medical Journal*, June 5, 1920, Mr. Donville says that Lady Horsley has withdrawn any objection she had previously expressed, and it is hoped to found a lectureship bearing Sir Victor Horsley's name, probably under the auspices of the University of London, but all details have yet to be formulated by the much larger committee which is in course of formation. Sir Victor Horsley was probably the greatest English speaking medical scientist of this generation. His investigations into the surgery of the brain were epoch making and paved the way for the marvellous operations now done in that region. He was essentially a pioneer in medical science and no Englishman who died in the war fighting for country and civilization is more worthy to be remembered.

* * *

With regard to the need for more dentists in Great Britain and the prevalence of dental disease in various forms, the speakers at the Congress of the Food Education Society held in Manchester, on May 13, 1920, emphasized the gravity of the situation. Among these speakers none was more interesting, original, and scientific than Dr. Harry Campbell. In the course of his speech he stated that the public stood in need of four great health reforms, namely, food, dwellings, including satisfactory working conditions, alcohol, and lues. All the political questions of the day are as nothing compared to the urgent need for reform in these four directions. Dr. Campbell said further that perhaps the greatest reform needed in Great Britain was the reform of the faulty dietetic customs of its inhabitants and one of the consequences of these bad dietetic habits, namely, the shocking state of the nation's teeth, which in his opinion were the worst of any nation. The number of dentists in Great Britain was wholly inadequate.

Editorial Notes and Comments

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NEW YORK, SATURDAY, SEPTEMBER 18, 1920.

THE FUTURE OF HOSPITALS.

It seems as if the mode of medical practice is about to undergo a change. If the situation in Great Britain be taken as any criterion of other nations a change is coming. It is likely that the practice of medicine in the future will have more of a preventive character than now. This is not to say that curative and remedial treatment will not be employed, but the object will be to diagnose early and to prevent ailments from attaining serious dimensions. Sir James Mackenzie, the British heart specialist, is the pioneer in this departure from traditional methods, and his idea is that the student and the general practitioner should be trained to detect early symptoms. At St. Andrews, in Scotland, he is endeavoring to put his views to practical use. If this method of preventing disease is shown to be successful, it follows that the function of the hospital will change. At the present time the function of the hospital is to take charge of cases which the general practitioner does not think fit to treat. Hospitals afford opportunities for research which are not available under such favorable conditions elsewhere and lastly they provide the means for teaching students. It is obvious that the most important function of the physician is to diagnose correctly.

Comparatively little disease is detected in the hospital. Only serious cases are sent in, for if slight cases are admitted they are not or should not be kept long. The great proportion of early disease is seen in general practice; only when disease is estab-

lished is the patient deemed a fitting inmate of a hospital. Therefore hospitals should be employed mainly as centres for diagnosis and when diseases have been recognized the sufferers therefrom should be sent to the country to be treated and cared for. This would be an economical procedure. Rents in the country are considerably lower than in the city, fresh air abounds and a pleasant environment is accessible. By these methods medical education might be directed into more productive channels and more in keeping with the latest views.

There would be no need of the palatial buildings which are now considered necessary for these institutions. The money that has been thus expended in bricks and mortar, and especially in this country during recent years, might in many instances have been put to better purpose. The war has taught the value of the hutted hospital, which in the country is more suitable and comfortable than the magnificent buildings which are erected in the big centres of population. The conception of the functions of the hospital held by many who have made a life long study of the subject is not as a place in which treatment for an indefinite time may be given or in which those suffering from organic diseases may linger until death releases them, but as an institution in which certain medical and surgical cases may be treated, and above all as medical clearing houses. The scheme is as yet only in embryonic form and doubtless is surrounded with many difficulties. It may never develop and certainly will be subjected to much destructive criticism. On the other hand, none of the difficulties appears to be insuperable and even if discussion is aroused as to the true functions of the hospital, the question will not have been in vain. The hospitals as they are now are by no means perfect and the hospital of the future must be a revised edition of the existing institution.

GENERAL EFFECTS OF SUPRARENIN.

The general effects of left suprarenin are similar to those of other bodies of the same group. All these substances exhibited in toxic doses produce death from pulmonary edema, which occurs within a few minutes or several hours later. The cause of this edema is not clear. Some writers attribute it to excessive pressure; Gerhardt maintains that it exercises a nefarious action on the heart, especially the left heart, while Hallion admits that adrenalin attacks the endothelium of the pulmonary vessels. It is clear in all experimental work that it is pulmonary edema which kills the animal, and in his

many experiments Loup, of Geneva, is particular to state that he never met with cardiac fibrillation. It seems certain, however, that the mechanism of the edema is different in the case of rapid and of tardy death. In the former the serious cardiac disturbances which accompany excessive pressure are sufficient to explain the accident; in the latter the edema occurs at the time when the pressure has fallen to normal for some time and the heart beats are regular. It would therefore seem as if the pulmonary edema was simply the last phase of more complex phenomena. It may be that its cause should be looked for in a change of the pulmonary endothelium, since at the time the edema arises there is present a cardiac disturbance which explains its occurrence.

Death is preceded by manifestations of muscular paralysis of central origin, all this group of substances producing them, although they are more intense from left suprarenin. Naturally it is in tardy death that they are more easily observed. The animal often languishes for hours without being able to move and responds hardly at all when excited. Nevertheless, it is rare that he is incapable of any movement, as the paralyzes are generally incomplete, while their intensity varies during the progress of the intoxication. They usually increase up to the time of death and when this takes place the animal will have been an instant in complete inertia. Tardy death appears to be at least partially due to gradual weakening of the central nervous system, and this opinion is confirmed by the fact that at the time of death the asphyxia resulting from the pulmonary edema produces only very weak convulsions, sometimes none, and that strychnine no longer has any action on the profoundly depressed animal. The sensibility appears to be almost wholly preserved excepting in the last stages of the intoxication. Finally, there is an inconstant glycosuria, with salivation and occasionally dilatation of the pupils. The respiration, which is suspended for an instant following the infection, begins again superficially and rapidly. Occasionally the dyspnea is interrupted by a series of deep, slow respirations which last only for a few minutes. Surely lethal doses cause death quickly, while weaker doses—which some animals resist—kill more slowly.

Briefly, it would seem as if this group of substances kills rabbits either rapidly from cardiac disturbances set up or tardily by progressively increasing paralysis of the central nervous system, although in each case pulmonary edema is the immediate cause of death. All the substances belonging to this group produce the same clinical picture. The lethal dose varies.

Aberhalden and Glava have studied the toxicity of right and left suprarenins in mice by subcutaneous injection. Left suprarenin kills the animal at a dose of one tenth milligram, while one centigram of right suprarenin is necessary to kill. The latter should consequently be one hundred times less active than the levogyric form. This difference with the results arrived at by Loup may be due to the matter of introducing the drug as well as the species of animal used for the experiments. Mice, like rabbits, die either a few minutes following the injection or after some hours. They present complete muscular paralysis and a considerable drop in temperature. At the time of death the temperature falls to 20° C. Loup, experimenting with rabbits, never met with a temperature lower than 34° C.

PHYSICIAN AUTHORS—DR. JOHN McCRAE

The World War seems to have reawakened a universal interest in the Muse and apparently the interest has not yet reached its uttermost heights. This interest is manifested in two directions. First, the output of new poetry is so great and of such quality that an impression is arising that another golden age of poetry is at hand. Second, books of poetry are selling as they never sold before—single limited editions no longer are the rule; nor do the volumes grow dusty and worn on the shelves of the shops. Psychologists can give you elaborate reasons for all this, but those reasons need not be set down here.

Scarcely had war's first tocsin sounded when this remarkable reanimation of the Muse began. Thereafter throughout the course of the conflict there was a steady flow of poetry, good, bad and indifferent. Most of it is doomed to oblivion—is already forgotten—but there is one poem that was born of the terror and suffering at the front that the world will never forget—Dr John McCrae's *In Flanders Fields*. Unquestionably this is the great outstanding poem of the war period, the most widely read, the most widely quoted of all. Who has not heard it recited from platform, pulpit or stage during bond drives and war gatherings of all descriptions? The souls of mankind often have been stirred to great emotional heights by the versifier's fervor and skill, but it is doubtful if in the whole realm of literature any other bit of verse ever was so successful in firing the hearts of humanity.

If ye break faith with us who die
We shall not sleep, though poppies grow,
In Flanders fields.

Whatever its merits as poetry, *In Flanders Fields* is assured of immortality. Its historical

association has given it a permanent place in literature. It gave expression to a mood that was well nigh universal and will remain as a permanent record of that mood, now that it has passed away. Dr. McCrae's fame will rest on this single poem, just as surely as the fame of Charles Wolfe rests solely on *The Burial of Sir John Moore*. McCrae's other poetry is meagre—one slender volume holds all of it—and, although it reveals here and there the touch of the true poet, it is not remarkable as poetry. The volume also contains some of Dr. McCrae's prose writings, mostly extracts from diaries and letters. He wrote many essays on miscellaneous subjects and many contributions to medical publications, but these have not been collected. Other than the volume of poetry, the only book that bears his name is a *Textbook on Pathology*, of which he and Professor Adami of McGill University were coeditors.

Writing was distinctly a pastime with Dr. John McCrae, his biographer tells us, adding that medicine was his main concern in life, in the profession of which he spent twenty years in study, practise and teaching. He was said to be a born teacher. When he was graduated from the medical school of the University of Toronto in 1898 he was the gold medallist of his class. He began his career in medicine as an intern in Toronto and Baltimore hospitals, but interrupted this work to get his first taste of war. This was in South Africa in 1899 and 1900, where he was a lieutenant colonel of artillery during the Boer War and won the Queen's Medal with three stripes. A number of his poems were inspired by his experience on the veldt. After his return from South Africa he resumed intern work, but soon accepted a professorship in pathology at McGill University. For several years he also was professor of pathology at the University of Vermont.

McCrae was one of the martyrs of the war. He was aboard ship on his way to London when the war broke out. Immediately upon disembarking he cabled home, offering his services, and was appointed by his old friend, Major General Morrison, to be surgeon of the First Brigade, Canadian Artillery, in which capacity he served throughout the fighting along the Ypres sector, where the Canadians covered themselves with glory. He was under intense shell fire often, for periods of many days, and his brigade was behind the area where the first gas attack was launched. In his diary he gives a graphic description of their moving up to hold the front line trenches. It was during his fourteen months with the Ypres guns that he wrote *In Flanders Fields*, which was first published in *Punch*.

Overwork and the conditions under which that work had to be performed, undermined his health and he was finally persuaded to leave the front and accept a transfer to a base hospital, where he served two years. In the performance of his duties he was stricken with pneumonia, complicated by meningitis, and died after five days' illness. McCrae came of old Scotch stock that emigrated to Canada about the middle of the last century, settling in Guelph, Ontario, where he was born in 1872.

A PROBLEM.

A recent perusal of Charles Reade's *Hard Cash* created a lively feeling of gratitude to all legislators, philanthropists, and authors who had brought into glaring, uncompromising daylight the inmates of our lunatic asylums. There were those competent, but debarred from speaking for themselves; those bullied into greater debasement, whose every word was disbelieved by men in authority, and usually ended in becoming what their keepers said they were. Now the doctors, in danger of being driven mad themselves by overwork, answer the legislators and philanthropists by demanding more trained help, more buildings, more prophylaxis. A man is found incapable on the street by a policeman. His behavior is eccentric. Is he mad, drugged, or drunk? The doctors say that policemen should be trained to discriminate. A man is certified as mad and committed to an asylum where he associates with many far worse than himself. The medical committee demands trained keepers, budding alienists with the patience of Job, to observe the men. You say the insane are capable of being taught habit formation. Send us proper teachers who will adapt their teachings to each man's ability. This is not doctor's work.

There are thousands of delinquent boys and girls who for their own protection and that of society must be confined. The old plan was to term all of them idiots or wanting. Now there are a dozen fine distinctions. Train teachers, train nurses, send them to help the doctors. Thousands of mentally deficient girls add to the population every month, and the doctor, a democrat when an obstetrician, opens the gates of life as politely to a weary faced little idiot as to a plump young Hercules. But his cry is, send settlement workers, send lecturers, send reformers of homes to spread the knowledge of evitable evils; not ours the tremendous task of grappling with the evils an educated public should provide funds to prevent. Whether insane or criminal, a test, an analysis, is now demanded. There are many

who should be transferred to the asylum from the prison, many who should go to prison. But who is to decide wisely unless a mighty band of competent people are trained to go on the institutional staff, and who is to find the money? Are the helpers to be paid as generously, as adequately, as the overworked doctors who try to do all the social reformers imagine it is the doctor's work to carry out?

The lunatics, idiots, feeble-minded form only one section of those demanding medical care. Open war is declared against the venomous, devastating trio, cancer, tuberculosis, syphilis, while influenza gathers fresh forces every year. The doctor is also required to cooperate with the engineer in rendering new lands habitable, in determining healthy conditions for those who submarine, for those who super-terrate, and as yet their number of skilled assistants is pitifully small. The doctors' protest against more work is no mere petty, selfish consideration for themselves or righteous demand for more money, but the protest of those who realize what ought to be done yet cannot do it.

EXPECTANT INDIA.

With the courtesy and patience characteristic of the Indian, statements of the urgent need for medical reform have been put before the British authorities during long years. The latter urge that no real help would be given to the millions committed to their care by giving them half-trained medical men and that funds are lacking for furnishing any appreciable increase in the supply of qualified ones. Even if more medical schools and colleges are to be opened, the pay, position and prospects are so poor that they militate against the popularity of the service. There is no inducement for a young doctor to take up rural practice in the government dispensaries. He gets no practice, all minor ailments being sent to bigger medical institutions, and no surgical equipment—not even a stove or sterilizer being provided, whereas hydrocele, anal fistula, piles, buboes, amputations, could be treated if proper equipment were provided. Knowledge rusts for want of use, and a listless laziness assails the young doctor. There are two species of medical men, one possessing university qualifications, the others diploma holders from a governmental or competent examining body. The present anomalous position of medical graduates and diploma holders should be at once done away with. The standards of minimum qualifications for admission in the different provinces vary and this is greatly due to the absence of a General Medical Council for India to control the medical education of the whole country. The minimum qualification for admission into any institution should be laid down by the Council, and recruitment to the Civil Medical Service be by open competition. The postponement of some of the most pressing health reforms is due to the paucity of medical men. There are hundreds who

eagerly look to medicine for an honorable career, but the institutions for learning are so few, the accommodation in these so limited that numbers have to be turned away.

WEALTH AND HEALTH.

The Industrial Fatigue Research Board of England has put forth one excellent report after another shedding light on the human machine in industry. Some of its studies are general, others deal with particular industries. The latest report, by Dr. H. M. Vernon, is on *The Speed of Adaptation of Output to Altered Hours of Work*. Commenting editorially on Dr. Vernon's findings, the *Lancet* says:

"These facts suggest that there is a certain amount of energy at the daily disposal of the human machine; that there is a definite urge forward to expend this energy, an urge due to the anabolic activity of rest stimulating the katabolic activity of work; and that when the two balance one another a level of productive activity is maintained. Practice may increase productivity still further, but practice only consists in using energy economically, so that more things are made with the same exertion previously required for making fewer. Interest also centres on the fact that quicker work during shorter hours is associated with less lost time (represented by sickness), from which health appears to be a function of activity; and, from the viewpoint of health, there appears to be an optimum rate of activity for the human organism which seems to coincide with the optimum rate of production. The Industrial Fatigue Board will indeed justify its existence if it is able to convince those who control the destinies of the industrial world that material wealth and individual health depend, so far as labor is concerned, on the same factors."

News Items.

Cannot Prescribe Whiskey for Yourself.—Under a new ruling of the Bureau of Internal Revenue, medical men cannot make out prescriptions for whiskey for themselves, even though they are sick.

Loyola University Appointments.—Dr. Charles Louis Max has been appointed professor and head of the department of medicine and Dr. Edward L. Moorehead has been appointed professor and head of the department of surgery in Loyola University School of Medicine.

Surgeon Lavinder Named Assistant Surgeon General.—Senior Surgeon C. H. Lavinder, formerly in charge of the hospital division of the U. S. Public Health Service, has been named assistant surgeon general and is now in charge of the division of hospitals and relief.

Poliomyelitis Increasing in Boston.—An increase in the number of cases of acute anterior poliomyelitis is reported in Boston. There were seventeen cases in that city between January 1st and July 1st, sixteen cases during July, ninety-four in August, and sixty-three for the first nine days of September.

Hospital Bequests.—The will of the late Congressman Colonel Thomas W. Bradley, of Walden, New York, leaves \$5,000 to St. Luke's Hospital in Newburgh, and \$5,000 to the Thrall Hospital in Middletown.

Death of Indian Medical Editor.—Lieutenant Colonel William Dunbar Sutherland, imperial serologist to the Government of India and formerly editor of the *Indian Medical Gazette*, died June 27th in Calcutta, at the age of fifty-three.

Hospital Association Meeting.—The American Hospital Association will hold its twenty-second annual conference October 4th to 8th at Montreal. In connection with the meeting there will be reports from the American Conference on Hospital Service.

Hospital Bequests.—The will of the late Berthold Bendheim, of New York provides the following bequests to hospitals: \$2,000 each to the Mount Sinai Hospital and the Montefiore Home; \$500 each to Beth Israel Hospital and St. Mark's Hospital.

New York State Health Conference.—Dr. Guy H. Turrell, of New York, was elected president of the conference of New York state health officers and public health nurses, held recently at Saratoga Springs. It was decided that the 1921 conference will be held at Ithaca.

End Latvian Relief.—The child feeding work of the American Relief Administration in Latvia has been terminated. That country now has sufficient food to meet its needs, and in addition the government has built up an effective child welfare system that will continue whatever relief is necessary.

United States Civil Service.—The United States Civil Service Commission announces an examination for microscopist in the office of the surgeon general, Army Medical Museum, Washington, D. C., at \$1,800 a year plus a bonus of \$20 a month. Receipt of applications will close October 19th.

Public Health School at Georgia University.—A School of Public Health and Hygiene is to be added to the medical department of the University of Georgia, at Augusta. Dr. C. C. Applewhite, P. A. Surgeon, U. S. Public Health Service, has been detailed to Augusta for the purpose of starting the school.

For Ratproof Buildings.—At a recent conference of public health officers at Beaumont, Texas, to discuss bubonic plague, recommendations were made to Surgeon General Hugh S. Cumming that the Public Health Service draw up standard specifications for ratproof buildings and furnish these to the different states and cities for incorporation in building codes throughout the country.

Delegates to Antialcoholism Meeting.—Governor Smith, has appointed delegates to represent New York state at the Fifteenth International Congress Against Alcoholism, to be held in Washington, September 21st to 27th. The following medical men are among those named: Dr. Charles W. Pilgrim, chairman of the State Hospital Commission, of Albany; Dr. Mathias Nicoll, Jr., deputy commissioner of health, Albany, and Dr. Pearce Bailey, of Katonah.

Pellagra Hospital to Be Discontinued.—The Pellagra Hospital at Spartanburg, S. C., maintained by the U. S. Public Health Service has been discontinued because the disease has been practically wiped out in that locality. The equipment will be distributed among other hospitals of the Public Health Service.

Railway Surgeons Elect Officers.—Officers have been elected as follows by the Baltimore and Ohio Association of Railway Surgeons, recently in convention in Baltimore: President, Dr. E. B. Fittro, of Salem, W. Va.; vice-presidents, Dr. J. G. Shirer, of Newark, Ohio; Dr. V. D. Lespinasse, of Chicago; secretary-treasurer, C. E. Johnson, of Baltimore.

Death of Sir William Babbie.—Lieutenant General Sir William Babbie, V. C., of the British Medical Service, died the early part of September while spending a holiday in Belgium. He was sixty-one years old. Sir William Babbie served as principal director of medical services in 1915-16 in Gallipoli, Egypt and Salonika and later as director and inspector of medical services at the War Office.

Navy Drops Whiskey as Medicine.—Spiritous liquors are to be dropped from the supply table of the medical department of the Navy, according to an order recently promulgated by the Bureau of Medicine and Surgery prohibiting their issuance to naval vessels for medicinal purposes. Medical supply depots may issue whiskey only to hospitals, and when the present supplies have become exhausted, whiskey will be banned entirely. The order states that when whiskey is no longer available and a medical officer deems alcoholic stimulation absolutely essential for the preservation of human life, the ethyl alcohol obtainable from supply officers may be prescribed. This alcohol conforms in all respects with the requirements of the United States Pharmacopœia. The order directs that no further purchase from any source be made of distilled spirits, wine or alcohol preparations. It is estimated that the supply on hand will last only two or weeks.

Personal.—Dr. James M. McTiernan has removed his office to Euclid Hall, Broadway and Eighty-sixth street, New York.

Dr. George Chaffee, formerly of New York City, announces the opening of his office at 100 Hawley street, Binghamton, N. Y., practice limited to operative bone surgery, maternity cases, and to consultation.

Dr. John W. Moore has been elected full time professor of research medicine in the medical department of the University of Louisville, Kentucky.

Dr. Leonard G. Rowntree, professor of medicine in the medical school of the University of Minnesota, and Dr. Reginald Fitz, associate in medicine of the Massachusetts General Hospital, have joined the staff of the Mayo Foundation and the Mayo Clinic at Rochester, Minn.

Dr. J. G. Adami, F. R. S., Vice-Chancellor of the University of Liverpool and lately Strathcona professor of pathology and bacteriology in McGill University, Montreal, has been elected to an honorary fellowship at Christ's College, Cambridge, of which he was formerly a scholar.

Proposed International Health Office.—The Council of the League of Nations has recommended for formal adoption at the General Assembly of the League in November the proposal for an international health office prepared at the recent London conference. The London conference of public health experts made a series of detailed recommendations regarding the functions and duties of the proposed organization, the incorporation within it of the existing *Office Internationale d'Hygiène Publique* established under the Rome Convention of 1907, and the nature of the permanent machinery which the new international health office would require.

Death of Professor Gautier.—Dr. Armand Gautier, professor of chemistry in the Faculty of Medicine of Paris and director of the laboratory of biological chemistry, died July 27th at Cannes, France, at the age of eighty-two years. He was the discoverer of leucomaines, and he studied with equal success many other problems relating to cell tissue and general hygiene. He made the discovery of arsenic as a normal element of animal tissues, of free hydrogen in the air, of iodine in the land algæ, of the genesis of mineral waters, of the rôle of fluorine, and of a new method of preparation and therapeutic application of certain organic compounds of arsenic.

Acid Test for Chauffeurs.—Due to the frequency of automobile accidents in New York city, Health Commissioner Royal S. Copeland has written a letter to Secretary of State Francis M. Hugo suggesting amendments to the Sanitary Code which will make it impossible for persons with defective sight or hearing or those addicted to narcotic drugs to become chauffeurs. Dr. Copeland pointed out that 398 people had been killed by automobiles in the first seven months of this year and that 767 lost their lives in 1919. Out of 7,464 self confessed drug addicts registered with the health department, 534 were listed as drivers or chauffeurs. Dr. Copeland also stated that many chauffeurs had defective sight or hearing.

Health Department Plans More Consultation Clinics.—The Group Consultation Clinic held during the week of August 22nd at Goshen, N. Y., proved so successful that the State Department of Health is planning similar clinics for other localities. Dr. E. C. Body is quoted as follows in the daily press regarding the conduct of the clinic:

"Patients are referred to the clinic by their attending physician. After a careful history of the case the patient is referred to the proper consultant for examination. If the consultant thinks that additional information is necessary before a diagnosis is made, such as laboratory examination or an x ray examination or examination by another consultant, the case is referred to that department.

"When the examinations are completed the consultant reviews all the evidence, makes his diagnosis and any recommendations concerning the future course of procedure for the patient. All this information is then forwarded to the patient's attending physician. It is obvious that under this arrangement the relation between the patient and family doctor is not altered in any degree, and that the clinic is conducted along ethical lines."

Insanitary Dairy Conditions Found.—Investigations conducted by the Bureau of Foods and Drugs of the Department of Health of New York city have disclosed insanitary dairy conditions which are considered contributory to the high bacterial content of Grade B milk. According to a letter from Mr. Ole Salthe, acting director of the bureau, to the New York Milk Conference Board, milking machines were improperly cleaned between milkings, clean milk cans were not allowed to air, milk was insufficiently cooled, milking utensils were not properly washed, and in several dairies dirty stables and cows were found.

Proposed Hospital for Insane Soldiers.—Plans are under consideration by state officials for the erection by New York state of a hospital for insane soldiers, the hospital to be operated and maintained under the supervision of the War Risk Insurance Bureau. An appropriation of \$1,000,000 will be asked of the Legislature for this purpose. At the present time there are in the state about 900 former service men who have become insane. Of this number 474 are in state hospitals and the rest in other institutions. The need of such a hospital is evidenced by the overcrowded condition of the state hospitals for the insane.

Civil Service Examinations.—The New York State Civil Service Commission announces examinations, written or unwritten, for the following positions: medical examiner and assistant medical examiner, State Industrial Commission, \$2,000 to \$2,800; physiological chemist State Department of Health, \$1,650; sanitary supervisor, State Department of Health, \$3,500; laboratory assistant in bacteriology, State Department of Health, \$1,500; assistant in pathology, State Institute for the Study of Malignant Disease, \$2,500; dentist, State Hospital Service, \$1,200 to \$1,500; first assistant physician, Letchworth Village, \$2,500 and maintenance; psychologist, New York State Reformatory for Women, Bedford Hills, \$1,000 and maintenance; supervisor of child hygiene centres, State Department of Health, \$3,000; supervisor of tuberculosis hospitals, dispensaries, and clinics, State Department of Health, \$3,000.

Died.

COMFORT.—In Port Dalhousie, Ont., on Monday, September 6th, Dr. John Harris Comfort, aged ninety-three years.

COX.—In Stanford, Va., on Friday, July 30th, Dr. J. Edward Cox, aged fifty-two years.

GERRISH.—In Portland, Me., on Wednesday, September 8th, Dr. Frederick Henry Gerrish, aged seventy-five years.

MC GUIRE.—In Dobbs Ferry, N. Y., on Sunday, September 12th, Dr. George Harrington McGuire, of New York, aged fifty-eight years.

MORGAN.—In Hadlyme, Conn., on Monday, August 30th, Dr. John Morgan, of New York, aged seventy-five years.

O'DAY.—In Dover, Del., on Tuesday, September 7th, Dr. Edward Francis O'Day, aged fifty-four years.

RYAN.—In Glendale, Cal., on Thursday, August 19th, Dr. Lee Mathew Ryan, aged thirty-seven years.

STOUT.—In New York, N. Y., on Tuesday, September 7th, Dr. Stephen V. W. Stout, of Jersey City, N. J., aged seventy-four years.

THOMAS.—In Cambridge, Mass., on Saturday, September 4th, Dr. Charles Holt Thomas, aged seventy years.

Book Reviews

THE PSYCHOLOGICAL INTERPRETATION OF RELIGION.

Religion and the New Psychology. A Psychoanalytical Study of Religion. By WALTER SAMUEL SWISHER, B.D. Boston: Marshall Jones Company, 1920. Pp. xv-261.

The time is ripe for a book such as this. There are signs of the awakening of interest in psychoanalysis in every department of life; there is active inquiry into its practical value. In this case the new psychology has as much relation to religion as to any so-called secular province. Swisher's conception of religion is that of a certain department or phase of human interest which cannot be detached from the whole. Religion to him is one of the means by which life may attain that freedom of expansion in which alone lies the realization of well being and of satisfying activity.

In his broad study of religion he shows it as a means by which this end may be attained, but at the same time it may be used only to fix more firmly the factors which obstruct freedom. Religion has worn different aspects throughout history. That its more conspicuous later day function is an ethical one does not blind the writer to the element of wish fulfillment in self-protection and in sexual need which forms its source. Long before ethics played a part man created his religion to support and satisfy him in a world of undesirable or difficult reality. Swisher, examining the content of the unconscious, gives ground for his assertion that "religion is primarily emotional and is thus, in the broadest sense, of sex origin."

He discovers in early man the need to be freed from a sense of helplessness and of the bondage of his own powers. This is the content of the later sense of sin. The writer confesses that he differs somewhat from Freud in not accepting the early fear of one's own impulses as the origin of the sense of sin. Freud would see an ethical sense arising in man's earliest experience. Here it is that religion and psychoanalysis manifest sameness of aim and that psychoanalysis enters to interpret the function of religion and to guide its function in accordance with the more scientific needs of the present time. Both seek to free the repressions and permit the individual a realization of his elements of power and freedom in their use. It is psychoanalysis which has discovered the existence of repressions and the hemming of power through them and which adds to the older methods of religion its principles of investigation and readjustment.

Swisher presents in interesting comparison the forms and methods with which religion has helped man toward this end. Examples of the misinterpretations of religion which have tended toward fixations and repressions are prominent in the Christian religion in some of its phases and exponents. Often religion has been only the opportunity for the play of certain neurotic traits. The writer makes his position plain: these are not necessary results of religion. Religion may, however, be joined to a neurotic character and furnish fruitful opportunity for the development of neurotic features. Here the province of religion is enlightened

by psychoanalysis. Originally religion sought chiefly the setting right of the individual with unknown powers; now the emphasis is laid upon his social relations.

The author has discussed in brief but sprightly fashion a number of problems which have always perplexed men. He turns the broad light of the unconscious upon the mystic experience in religion, upon the occult and its prominence in belief. He treats with special clearness the psychology of the various forms of healing associated with religion as he does that of conversion. Free will and determination in religion are presented in the light of the new psychology; so also is man's relation to the problem of evil. The author makes a rightful distinction between evil without or cosmic evil and that within and shows the relation of each to man's individual psychic freedom or repression. In brief the book is a lively presentation of old mooted points in religion, giving them new life and an illumination as to their origin and significance in man's psychic life. At the same time it presents the facts of psychoanalysis in a simple fashion which should make an authoritative and stimulating appeal to the general reader. Sometimes these psychoanalytical facts might be more deeply pressed into or the implication in regard to religion might be pressed further. Nevertheless the author has spoken fearlessly. Such a book, in the style in which it is written, must do much to fasten attention upon psychoanalytical advance and at the same time render service in the explanation and maintenance of the essential in religion.

FROM THE RUSSIAN.

An Honest Thief and Other Stories. By FYODOR DOSTOEVSKY. From the Russian by CONSTANCE GARNETT. New York: The Macmillan Company, 1919. Pp. i-325.

The Chorus Girl and Other Stories. By ANTON CHEKHOV. From the Russian by CONSTANCE GARNETT. New York: The Macmillan Company, 1920. Pp. iii-301.

Letters of Anton Chekhov. With Biographical Sketch. Translated by CONSTANCE GARNETT. New York: The Macmillan Company, 1920. Pp. i-416.

Until recent years there has been a paucity of translations into English of representative Russian literature. Tolstoi, Turgenev and Gorky were among the most frequently read of the writers, while Gogol, the father of modern Russian literature, Dostoevsky, the master of all writers, and the incomparable Chekhov, who is without a peer in the realm of short story writers, received little consideration among English readers in America. In England translations from the works of these writers were more frequently encountered.

The influence of Chekhov is being felt today more than ever before among English writers. It may be said without exaggeration that his works today exert an influence similar to that of Henry James in the same field a decade ago. All this before he has been widely read by the public at large. His plays, with their rich symbolism, are more influential in their effect upon English writers than his short stories. Didactic professors and the no less didactic critics have given Maupassant a clear field in the realm of short story telling; Chek-

hov received scant consideration. There is little to compare. The French writer is decadent, while the Russian presents life and people meeting life. Progress on the one hand, smug mouthings on the other. In our Anglo Saxon prudery Maupassant has spiced many dull hours for us but he has done little else. Chekhov has given us warmth and movement, ever forward, ever in close contact with human, very human beings. On the one hand an incipient disease, on the other, a solid healthy growth.

Reading the letters of Chekhov we get nearer to the man, and such a man! His was a constant struggle—poverty, the difficulties of his profession, and tuberculosis. Through all this we find him optimistic, rarely introverted, always productive, and giving of himself and his abilities to the world. Through his constant activities he acquired an understanding of men and their problems. Whenever difficulties were to be faced he did not shirk his responsibilities. During epidemic and famine we find him working far into the night alleviating the sufferings of his neighbors and he always found time to do the thing he most wanted to do—to write. This active life of his should be a splendid lesson to those whose chronic complaint of not being able to do the thing they most want to do becomes a melancholy whine, and to those who shift the responsibility of their own shortcomings, in surroundings that are excellent in comparison with those under which Chekhov, the sick man, labored. Tolstoi is credited with saying that Chekhov's medicine cluttered up his writing. This may be true, but it is difficult to contemplate what it would have been if he had not had his medicine. Perhaps it would be more fitting to say that Tolstoi would have had a more tolerant understanding of life and men if he had had the medical experiences of Chekhov.

The Chorus Girl and Other Stories contains an excellent collection of Chekhov's tales. His letters are a mirror of this splendid man. They are candid, full of enthusiasm and show a healthy outlook toward life. They are not imbued with sickly sentimentality, nor are they filled with self pity. They should not remain unread by anyone who is interested in literature or its makers.

Fyodor Dostoevsky! For many this is enough. When the rubbish of accumulated writing has been swept aside, in generations to come he will stand out boldly and clearly in sharp relief. In his works we find a giant struggling to express his own difficulties and through his constant battles finding insight into the problems of those around him. Poverty, epilepsy, gambling, and other supposedly non-social traits were his to overcome. From a timid boy he became a swaggering hero flattered by the success of his first works. He imagined himself a radical and was sentenced to death for what would today be considered less than a misdemeanor. At the last moment a courier brought the news that changed his sentence to imprisonment in Siberia. New sufferings and new insights followed. He became a broken man and his sensitive soul was beaten and bruised. He begged for mercy, and through influential friends came release, with new

adventures ever filled with despair and sadness. Then out of the press came his golden works.

In *An Honest Thief* and other stories we find a rather versatile collection of tales, some in the lighter vein, all with a fundamental psychological insight. The second of the series, *Uncle's Dream*, is wonderful in construction and very Russian in its concept. Some of the other stories have a more universal concept. The last story in the volume, *The Dream of a Ridiculous Man*, shows a splendid phantasy in which he portrays an ideal world—his ideal world. Here he goes back to childhood for his material, back to the past, and portrays a world as he would have it in the future.

Those of us who desire more than a flippant story, who desire a tale beautifully told, cannot do without Dostoevsky and Chekhov. If it is only a narcotic we are seeking, something we can easily read and quickly forget, we do not want to trouble ourselves with men of this calibre. For those of us who need this and nothing more these men have labored in vain and it may be said in truth that their works are much too good for us.

PERSONAL AND COMMUNITY HYGIENE.

Healthy Living. How Children Can Grow Strong for Their Country's Service. By CHARLES EDWARD AMORY WINSLOW, D. P. H., Professor of Public Health, Yale Medical School, and Curator of Public Health, American Museum of Natural History. Enlarged Edition. In Two Volumes. With Chapters on Physical Exercises and Sport and Health, by WALTER CAMP. New York and Chicago: Charles E. Merrill Company, 1920. Pp. iii-405.

There were one or two volumes which used to figure in our childhood's reading, chiefly about deportment, manners, and morals. There were good little children who kept themselves clean and gave pennies to the poor, and poor contented children, who knew their "station in life," and were duly grateful to the rich donors of pennies. The volumes before us would have been as much treasured as story books. They would have told us so much we did not know about our mysterious insides, the top part which had to have poultices on, and the lower, all stomach, which had griping pains and required shuddery remedies. We do not know whether the volumes are to be used as class books; we recommend them for private perusal with an offer of explaining the unfamiliar words afterward. There are questions at the end of each chapter which the thoughtful child will use; the physical exercises are easily learned. The chapters on Our Unseen Enemies, Some Undesirable Neighbors, Bad Habits, Fuel for the Body are easily understood and the meaning of such words as pasteurize gratefully explained. Some of the don'ts will irritate socialist fathers. "Stealing rides, coasting and roller skating in the streets are dangerous amusements." "Why do we have to play in the streets, Daddy?" asks the young reader. Clean clothes, daily washing of the body, ventilated rooms, are not always possible, even in apartment houses, where the bleaching green is often a network of strings across the back windows and the bathroom shared with the numerous offspring by one or two lodgers.

But it is the duty of an author to say what should

be done even though he sees no chance of his advice being followed. The ideas of cleanliness and good health may fall on good soil and breed distaste for a condition of things that tired mothers and fathers regard as inevitable.

The second volume seems destined for senior scholars and young teachers, though they may profess to have done the subject already. The chapters on the digestive system, hygiene of foods, care of the skin, germs, tuberculosis, municipal sanitation, the health board and its work, contain much they have forgotten. The idea is good, too, of not preaching health that one may lead a healthier life for the immediate benefits to self, but by showing forth its benefit to provoke and foster emulation and bring about municipal reform. To those of all ages looking back is encouraging. We can all recall conditions which today would not be tolerated, and there will always exist those who daily lament things as they are or disparage the bold adventures into the wild lands of ignorance, yet do absolutely nothing themselves except find fault.

SKIN DISEASES

Handbook of Skin Diseases. By FREDERICK GARDINER, M. D., B. Sc. (Public Health), F. R. C. S. E., Lecturer on Skin Diseases, University of Edinburgh. New York: William Wood & Co., 1919. Pp. 1-160.

The usefulness of these little manuals is more evident today, when the learned laity are more and more inclined to self treatment. This book will be a help to the young doctor who has not had time to keep his dermatology well brushed up. Yet he should ever bear in mind the interrelation of disease and not be content with treating effects. The chapter on tuberculosis brings in the wide question of radiotherapy. Some wonderfully clean healings of tuberculous sores have been effected with the ultraviolet rays, sores that had existed for over a year. Warts on the chin disappeared after three ray treatments. Syphilis is another big question which the author could not omit even from an elementary volume, but he wisely admits the inadequacy of a lecture and refers the reader to the result of a thorough examination by the best men procurable.

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

REPUTATIONS. Essays in Criticism. By DOUGLAS GOLDRING. New York: Thomas Seltzer, 1920. Pp. vii-232.

WOMAN AND THE NEW RACE. By MARGARET SANGER. With a Preface by HAVELOCK ELLIS. New York: Brentano's, 1920. Pp. xi-234.

TEN MINUTE TALKS WITH WORKERS. From *The Times* (London) *Trade Supplement*. Garden City and New York: Doubleday, Page & Co., 1920. Pp. viii-203.

OCCUPATIONAL DISEASES AND THEIR COMPENSATION. With Special Reference to Anthrax and Miners' Lung Diseases. By FREDERICK L. HOFFMAN, LL. D., Third Vice-President and Statistician, The Prudential Insurance Company of America; Member National Conference of Social Work, etc. Newark, N. J.: Prudential Press, 1920. Pp. iii-45.

KREBSBÜCHLEIN FÜR ANGEHENDE PRAKTISCHE AERZTE. Zürich: Hans Rhaue, 1920. Pp. i-69.

DWELLERS IN THE VALE OF SIDDEM. By A. C. ROGERS and MAUD A. MERRILL. Boston: Richard C. Badger, 1920.

AGLOHALLUCINOSIS. Von S. GALANT. Mit 8 Abbildungen un Text. Berlin: Verlag von August Hirschwald, 1920.

ALTITUDE AND HEALTH. By F. F. ROGET, a *Privat Dozent* Professor in the University of Geneva. New York: E. P. Dutton & Co. Pp. xii-186.

THE SURPRISES OF LIFE. By GEORGES CLEMENCEAU. Translated by GRACE HALL. Garden City and New York: Doubleday, Page & Co., 1920. Pp. vi-326.

THIRD INDUSTRIAL DIRECTORY OF PENNSYLVANIA, 1919. Department of Labor and Industry. CLIFFORD B. CONNELLEY, Commissioner. Harrisburg, Pa., 1920. Pp. ii-1212.

THE AMERICAN RED CROSS IN THE GREAT WAR. By HENRY P. DAVISON, Chairman of the War Council of the American Red Cross. Illustrated. New York: The Macmillan Company, 1920. Pp. i-302.

PHYSIOLOGY AND NATIONAL NEEDS. Edited by W. D. HALBURTON, M. D., LL. D., F. R. C. P., F. R. S., Professor of Physiology, King's College, London. New York: E. P. Dutton & Co. Pp. vii-162.

MILITARY PSYCHIATRY IN PEACE AND WAR. By C. STANFORD READ, M. D. (Lond.), Physician Fisherton House Mental Hospital, Salisbury. With Two Charts. London: H. K. Lewis Co., Ltd., 1920.

LEHMANN'S MEDIZINISCHE LEHRBÜCHER. Band I. Erkennung der Geistesstörungen. (Psychiatrische Diagnostik.) Von WILHELM WEYGANDT. München: J. F. Lehmann's Verlag, 1920.

PROCEEDINGS OF THE AMERICAN MEDICO-PSYCHOLOGICAL ASSOCIATION. At the Seventy-fifth Annual Meeting held at Philadelphia, Pa., June 18-20, 1919. Illustrated. Published by the Association, 1919. Pp. vii-600.

SCIENCE AND LIFE. Aberdeen Addresses. By FREDERICK SODDY, M. A., F. R. S., Dr. Lee's Professor of Inorganic and Physical Chemistry, University of Oxford; Late Professor of Chemistry, University of Aberdeen. Illustrated. New York: E. P. Dutton & Co., 1920. Pp. xii-229.

LECTURES ON INDUSTRIAL PSYCHOLOGY. By BERNARD MUSCIO, M. A. (Sydney), M. A. (Conville and Caius College, Cambridge); Late University Demonstrator in Experimental Psychology, Cambridge, etc. Second Edition, Revised. New York: E. P. Dutton & Co., 1920. (London: George Routledge & Sons, Ltd.) Pp. iv-300.

THE MEASUREMENT OF INTELLIGENCE. An Explanation of and a Complete Guide for the Use of the Stanford Revision and Extension of the Binet-Simon Intelligence Scale. By LEWIS M. TERMAN, Professor of Education, Leland Stanford Junior University. Illustrated. New York and Chicago: Houghton Mifflin Company. Pp. xviii-362.

PUBLIC HEALTH AND INSURANCE. American Addresses. By SIR ARTHUR NEWSHOLME, K. C. B., M. D., F. R. C. P., Lecturer on Public Health Administration at the School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Maryland; Late Principal Medical Officer of the Local Government Board, England, etc. Baltimore: The Johns Hopkins Press, 1920. Pp. xiv-269.

ATLAS UND GRUNDRISSE DER BAKTERIOLOGIE UND LEHRBUCH DER SPEZIELLEN BAKTERIOLOGISCHEN DIAGNOSTIK. Von Professor Dr. K. B. LEHMANN, Direktor des Hygienischen Institutes in Würzburg, und Professor Dr. Med. et Phil. R. O. NEUMANN, Direktor des Hygienischen Institutes in Bonn. 6. Auflage. Durch Einen Nachtrag Ergänzt Neudruck der 5. Auflage. Teil 1. Atlas. Teil II. Text. München: J. F. Lehmanns Verlag, 1919.

HYGIENE, DENTAL AND GENERAL. By CLAIR ELSMERE TURNER, Assistant Professor of Biology and Public Health in the Massachusetts Institute of Technology; Assistant Professor of Hygiene in the Tufts College Medical and Dental Schools. With Chapters on Dental Hygiene and Oral Prophylaxis, by WILLIAM RICE, Dean, Tufts College Dental School. Illustrated. St. Louis: C. V. Mosby Company, 1920. Pp. v-400.

Practical Therapeutics and Preventive Medicine

A Compendium of Treatment and Prophylaxis, Original and Adapted

Diets for the Ambulant Treatment of Diabetes Mellitus.—Herman O. Mosenthal and Herbert J. Wiener (*American Journal of the Medical Sciences*, July, 1920) says that the measured diets in the modern treatment of diabetes must meet two requirements, the control of the glycosuria and the control of the acidosis. The first is accomplished by regulating the consumption of carbohydrates, the second by adjusting the fat intake. Two sets of diets therefore are necessary, one in which the fats are reduced to a minimum, another in which fats are allowed more liberally, but in limited amounts. The latter is the preferable diet to use when possible, as it is more palatable when continued for a long time. The authors furnish seven tables illustrating the minimal fat diet and the low fat diet. Table I gives the minimal fat, starch free diet; Table II the meat and fish portions for use with the minimal fat diet; Table III a list of vegetables that may be used in both forms of diet; Table IV the low fat, starch free diet; Table V the meat and fish portions for use with this diet; Table VI the approximate quantities of protein, fat and carbohydrate in the minimal fat, starch free diet when round steak or bluefish are used as meat or fish; and Table VII the approximate quantities of protein, fat and carbohydrate in the low fat, starch free diet when roast beef, steak, or flounder are used as meat or fish.

Modern Individualized Dietary Treatment in Diabetes.—Marius Lauritzen (*American Journal of the Medical Sciences*, July, 1920) maintains that no single dietary scheme suits the different forms and stages of this disease, and that each patient has to be examined carefully and treated with the diet that qualitatively and quantitatively suits him at the time. In a mild case he gives the patient mixed food, or the diet prescribed by the practitioner who sent him, and makes quantitative examinations for blood sugar, urinary sugar, nitrogen and ammonia in the urine, acetone, diacetic acid, albumin, etc. The patient is then given a test diet for two or three days consisting of 150 grams of roast meat, four eggs, eighty grams of butter, fifty grams of cheese, three hundred grams of vegetables with two to five per cent. of carbohydrates, one hundred grams of compôte of rhubarb, two hundred grams of broth, one hundred grams of cream, one hundred grams of bread, one third bottle of claret, five hundred grams of tea, five hundred grams of coffee, and five hundred grams of soda water. This diet contains one hundred and four grams of protein, one hundred and forty grams of fat, seventy-two grams of carbohydrate, eighteen grams of alcohol, total 2,151 calories. In some mild cases the urine will be sugar free in two or three days. If this is not the case, or if the percentage of blood sugar remains above normal, a vegetable diet is prescribed for one day, and then an animal diet, which is like the test diet but without cream, bread, according to the nature of the case, being replaced by sixty to one hundred and twenty grams of gluten bread or

left out altogether, or changed for vegetables very poor in carbohydrates. The diet fixed in this way is kept up for months.

In uncomplicated cases of moderate severity one of the following methods of treatment may be employed.

1. The treatment described above, with strict vegetable diet for several days, may be applied until the attainment of the desired result, when a slow passage to mixed diet poorer in proteins than the first diet may be made.
2. Instead of a strict vegetable diet, fasting may be used as advised by Allen or Cantani, followed by a slow passage to a diet poor in protein.
3. One may rest content with intercalating one vegetable day at a time and then pass to a diet poorer in protein intercalating, if needed, another vegetable day, after which the ration of protein is further restricted, until blood sugar and urine are normal.
4. If the case is one in which ketonuria is likely to develop, as in children and in very young people, Lauritzen generally has recourse to Von Noorden's oat cure, with the rations of oatmeal and butter, kneaded in water to remove fatty acids, that are suited to each individual case; after the concluding vegetable days he slowly passes to strict animal diet with vegetables. If diaceturia is troublesome, small doses of alkalis may be used. In severe cases with acidosis of moderate severity, as a rule treatment according to method No. 3 is applied, with reduction of the protein, especially meat and food containing casein. Both protein and carbohydrate are gradually restricted and replaced by green vegetables until the attainment of aglycosuria and the lowest percentage of blood sugar possible.

If the immediate attainment of sugar freedom is wanted, vegetable treatment or fasting with confinement to bed is used. When aglycosuria and hypoglycemia are not attained by method No. 3, he tries Von Noorden's oatmeal treatment. If one of these methods succeeds in rendering urine and blood normal and removing ketonuria, diet poor in protein, plus vegetables poor in carbohydrate with washed out butter, or with olive oil, vinegar and other spices, and for drinks soda water, tea, coffee, and brandy should be continued as long as possible. In the severest cases with heavy acidosis treatment is more difficult and, as a rule, we have obstipation and dyspepsia to contend with. Confinement to bed for a considerable period is necessary. The acidosis will diminish through vegetable treatment or fasting with or without subsequent oatmeal treatment. Alkalis should be used. The diet in the aftertreatment must contain very small quantities of protein, vegetable protein and protein of hen's eggs are tolerated here better than any other. Carbohydrate must be derived from vegetables and fruits containing little. Avoid milk and cream. Alcohol is almost indispensable in large doses of claret, hock, sugar free champagne, brandy or whiskey according to the patient's liking.

The Treatment of Chronic Fatigue.—John Bryant (*Boston Medical and Surgical Journal*, June 17, 1920) says that the world is full of persons, mostly chronic invalids, who react excessively to sensory stimuli of both mental and physical origin. One obvious ultimate result of this continued overreaction to sensory stimuli is chronic fatigue, and the patient will not recover until this is relieved. In order to relieve the chronic fatigue, its cause must be attacked. Diet and exercise, properly used, are valuable factors in decreasing overreaction to sensory stimuli and promoting a return to health of the chronic invalid. The foremost essential in the regulation of the diet is the temporary elimination of meat and fish, and the thorough cooking and careful serving of all foods allowed. A direct method of raising the action of the control mechanism toward normal is the employment of a special type of physical exercise which has for its immediate object the sharpening of muscle sense perception in relation to balance and physical poise.

The Treatment of Thyroid and Other Endocrine Disturbances as Viewed by the Internist.—John A. Lichty (*American Journal of the Medical Sciences*, June, 1920) thus summarizes his paper: 1. Exophthalmic goitre or hyperthyroidism from other causes should be recognized early and treated promptly. 2. The earlier it is recognized, the more likely is medical treatment to be sufficient and to give permanent results. 3. The neglected cases or cases having definite pathology besides are likely to require surgery or röntgen ray, or both. In this is included radium. 4. The röntgen ray treatment of the enlarged thyroid presents most attractive advantages, but the indications for its use do not seem definite yet, and the results are not so certain. 5. In hyperthyroidism the röntgenologist and the surgeon at best can only break through a vicious circle for which the internist may or may not have been responsible.

Tissue Sparing Amputations of the Foot.—Savariaud (*Presse médicale*, February 7, 1920) notes that, in practice, it is seldom possible to perform a classical Lisfranc or Chopart amputation owing to lack of a plantar flap. Better than to resort to a Syme operation or some osteoplastic procedure involving the heel, is, if the disease is confined to the border of the foot and the tissues immediately adjacent, to bring over the integument from the opposite side. According to existing conditions, then, a flap is made on the inner or outer side of the foot with all the normal portion—usually a half—of the dorsoplantar integument. By slight twisting the flap is brought opposite to the cut bone surface and sutured. A good bearing surface is thus obtained upon the plantar aspect, and at the same time enough bone can be saved to reproduce a Lisfranc operation, though a flap only one half as large is required. The author employed this procedure in four cases, with excellent results. One patient had been subjected to trauma, another had a sarcoma of the muscles of the great toe, and two had tuberculosis of the inner tarsometatarsal bone tissues with sinus formation. The latter condition constitutes the largest field for the operation described.

The Cure of Chancroids with the High Frequency Current.—W. C. Kessler (*Urologic and Cutaneous Review*, May, 1920) emphasizes certain points in the technic: There is more danger of too little cauterization than too much; thorough cleansing at the time the sore is fulgurated must not be neglected; especial care must be exercised in carrying the spark well down into every fissure and undermined edge of the sore; the application should extend over the edge of the sore about one sixteenth inch into the apparently healthy area; the current is not turned off until every crack and crevice has been thoroughly treated and the surface of the sore has been turned to a dark greenish gray; the surface of the sore is then covered with a thick moist dressing of a two per cent. solution of boric acid; tap water often answers just as well. This method has produced excellent results. Treatment is given every two days.

Injection of Turpentine Oil in the Treatment of Lethargic Encephalitis.—A. Netter (*Bulletin de l'Académie de médecine*, April 6, 1920) recommends injection of oil of turpentine to induce a fixation abscess in all cases of lethargic encephalitis, as soon as the diagnosis has been made. Out of nineteen cases in which this measure was carried out and in which an abscess formed so that it could be incised, all but two patients recovered, and these two deaths were both in pregnant women, in whom lethargic encephalitis is known to be particularly dangerous. Recovery was especially rapid among the patients in whom the oil injection and the opening of the abscess were carried out early. This indicates that the treatment should be applied not only in the more severe cases but in all patients with this disease. The diagnosis of the latter may now be made quite early, thanks to the procedure of investigating the "electric" muscular contractions recently described by Sicard. Testing for the amount of glucose in the cerebrospinal fluid is likewise of service in early diagnosis.

Differentiation of Structures by the X Ray.—Gustav Kolischer and R. A. Arens (*Urologic and Cutaneous Review*, May, 1920) consider two problems: 1, How to accomplish the elimination of the secondary rays in order to avoid blurring of the picture, and 2, how to establish a graded relation between the pictorial density of the organs and certain pathologic changes.

The authors use an aluminum filter of two millimetre thickness, in order to prevent the interference of the secondary radiation with the clearness of the picture taken of an organ. This as a rule is sufficient to bring out the contours of the organ in question very clearly.

In order to illustrate the possibilities of this proposition, three observations are noted. In the first, in a case of sarcoma of the epididymis, the outlines of the tumor in contrast with the shadow of the testis were not to be seen distinctly on the röntgenogram until a picture with interpolation of a three millimetre filter was taken. In a case of unilateral proliferating tuberculosis of a kidney and in cases of kidney stone, the interpolation of the filter gave a much better and more distinct picture.

Proceedings of National and Local Societies

BRITISH MEDICAL ASSOCIATION.

*Eighty-eighth Annual Meeting, Held June 25, 1920,
at Cambridge, England.*

SECTION IN MEDICINE.

The President, Sir HUMPHRY D. ROLLESTON, K.C.B.,
M.D., F.R.C.P., in the Chair.

(Continued from page 432)

Diagnosis of Nervous Disorders of the Stomach and Intestines.—Dr. ARTHUR F. HURST, physician and neurologist to Guy's Hospital, pointed out that an attempt must be made to gain a clear conception of what was meant by certain terms, such as functional neurosis, psychoneurosis, neurasthenia, and hysteria. A functional disorder was one which did not depend upon organic change; it might be either biochemical or nervous in origin. Functional disorders of nervous origin were of two kinds: the neuroses, which were independent of mental processes, whether conscious or subconscious, and the psychoneuroses, which had a psychological cause. This distinction was of fundamental importance, as the psychoneuroses alone were amenable to psychotherapy. Neurasthenia had generally been classified as a neurosis, but it really depended upon definite though evanescent organic changes in the central nervous system and in the suprarenal and possibly endocrine glands, resulting from mental and physical exhaustion and chronic intoxications. It was, therefore, an organic and not a functional disorder. However, the relation of neurasthenia to the nervous disorders of digestion required discussion.

The psychoneuroses could be classified under the headings of hysteria and psychasthenia. Before the war Hurst would have classed the tics separately, but he was not convinced that they were really hysterical. By hysteria was meant a condition in which symptoms were present which had been produced by suggestion and were curable by psychotherapy. During the war his fellow workers and he gathered together a great deal of evidence to show that in the absence of gross hysterical manifestations there was no underlying condition to which the name of hysteria could be given. They had confirmed Babinski's observations that Charcot's physical stigmata were invariably a result of suggestion on the part of the observer, and, what was more important, they were firmly convinced that although an abnormal degree of suggestibility predisposed to hysteria, it was not essential and that hysteria might occur in individuals with a perfectly normal mental makeup. When this was once realized, it became clear that absence of the mental characteristics which lead to an individual being labelled as neurotic did not in any way exclude the possibility of the digestive or other disorder from which he was suffering being hysterical, any more than it could be assumed that symptoms in a neurotic girl were not due to

organic disease. It followed that a diagnosis could only be made from the nature of the symptoms and the results of physical and laboratory methods of examination.

Hurst pointed out that the traditional description of the nervous disorders of digestion depended upon false ideas of physiology and anatomy. It was, for example, assumed that a certain degree of tone and a certain activity of peristalsis were normal and that a normal stomach secreted juice of a certain strength. Any divergence from these standards, which were as a matter of fact often vague, was regarded as evidence of disordered function. Such a condition as atonic dyspepsia, due to atonic dilatation of the stomach caused by deficient tone, associated with deficient peristalsis and secretion, and acid dyspepsia due to hypersecretion were described, while the more scientific writer spoke of hypochlorhydria and hyperchlorhydria as clinical entities. In addition to the motor and secretory neuroses a sensory neurosis was recognized in which indigestion was supposed to result from hyperesthesia of the gastric mucous membrane.

Hurst's own investigations, which had been confirmed by numerous radiographers both in England and abroad, and the recent chemical investigations by fractional test meals carried out by Reh fuss and Crohn in America and Ryle and Bennett at Guy's Hospital, had shown that such great variations occur in the muscular tone, peristalsis, and secretory activity of the stomach in normal individuals that it might well be doubted whether what was generally regarded as atonic dilatation, hyperchlorhydria and hypochlorhydria did not really fall within the normal limits. This remained true even when the diagnosis was supported by an x ray examination and gastric analysis. Hurst had seen so many doctors who believed patients had atonic dilatation of the stomach, but found with the x ray that they had hypertonic stomachs, and he had seen so many many in which the symptoms pointed to hyperchlorhydria but actually achylia was present, that he was quite certain that it was utterly impossible to form a reliable estimate of the muscular or secretory activity of the stomach from a consideration of the symptoms alone. The investigations he carried out with several of the students of Guy's Hospital some years ago proved, moreover, that the theory of gastric hyperesthesia had no basis in fact, as the mucous membrane of the stomach both in health and disease was entirely insensitive to tactile, thermal, and painful stimuli and to hydrochloric acid up to the maximum strength in which it could conceivably be present in the gastric juice. The discovery of variations from the average normal tone peristalsis and secretion in individuals with digestive symptoms was, therefore, no evidence that these variations were in any way responsible for the symptoms.

The atonic dilatation and hyosecretion which were supposed to be the cause of dyspepsia of the exhausted neurasthenia as a rule existed only in the imagination, as there was not the smallest evidence to show that true neurasthenia in any way affected the motor or secretory functions of the stomach. He could well believe that an exhausted individual who happened to have a stomach the tone, peristalsis and secretion of which were below the average, would be more likely to suffer from indigestion than a man with a normal stomach. His condition might be correctly described as neurasthenic dyspepsia and he might benefit from treatment directed to increase the motor and secretory activity of his stomach, but it must be remembered that the neurasthenia was not the cause of the deficient tone and secretion, and that in the absence of the neurasthenia there would be no digestive symptoms although the deficient tone and secretion would still be present. Exhaustion might be the exciting cause of a different group of gastric symptoms in a man whose stomach was of the hypertonic hypersecretory type, and these symptoms might be the herald of an attack of duodenal ulcer. But the hypertonus and hyperchlorhydria were congenital and not caused by the exhaustion or the duodenal ulcer; they simply predispose to a certain form of indigestion—the acid dyspepsia or hyperchlorhydria of the textbooks which occurred as a result of various conditions, one of which was exhaustion. Hurst believed there was little justification for retaining such terms as atonic dilatation of the stomach, hyperchlorhydria, hypochlorhydria, atonic and acid dyspepsia, as descriptions of clinical conditions. We could separate two varieties of neurasthenic dyspepsia, which, however, could be recognized with certainty only by the aid of the x rays and gastric analysis; the atonic, occurring in an individual with a stomach with less than the average tone and secretion, and the hypertonic, occurring in one with a stomach with more than the average tone and secretion.

It was comparatively rare for a patient to consult a doctor on account of constipation without having already attempted to cure himself with aperients. But no accurate diagnosis could be made until it had been ascertained whether the patient was really constipated. In Dr. Hurst's experience the symptoms generally ascribed to autointoxication caused by intestinal stasis were really produced by purgatives. They led to the absorption of an excess of toxic material, partly by hastening the half digested contents of the small intestine into the cecum where fermentation and putrefaction were consequently increased, and partly by causing the contents of the transverse, descending and pelvic colon to be fluid instead of solid, so that absorption of toxins took place in the cecum and ascending colon alone. The patient should be instructed to see what happened if no drugs were taken for a week, an effort being made to open the bowels each morning. In most cases he quickly lost his abdominal pain and his so-called toxic symptoms. The bowels were often opened daily, in which case a diagnosis of hysterical pseudoconstipation could be made—hysterical because the patient had suggested to himself as a

result of faulty education combined with the reading of pernicious advertisements that he was constipated and required aperients to keep him well, whereas a little psychotherapy in the form of explanation of the physiology of his bowels and the origin of his symptoms, and persuasion to try to open his bowels each morning without artificial help, resulted in a cure. In many cases, however, the patient did not succeed in opening his bowels, although he might feel more comfortable than when he was taking drugs. A further abdominal and rectal examination should then be made. If no sign of organic disease was present and if, as was generally the case, no accumulation was felt in the abdomen, the rectum would be found filled with feces which were in some cases stony hard but in others quite soft, proving that there was no delay in the passage through the intestines. In spite of this the patient had no desire to open his bowels, although a normal individual would feel an urgent call to defecation under the conditions. In 1908 he called this condition of inefficient defecation dyschezia to distinguish it from true intestinal stasis, in which there was a delay in the colon. The majority of cases of dyschezia, which was the commonest form of severe constipation, were of nervous origin. They were caused by neglect to respond to the call to defecate owing to laziness, insanitary conditions of toilets, or false modesty.

The rectum gradually dilated, so that an increasing quantity of feces was needed to produce the internal pressure required to give the sensation of fullness which was the natural call to defecation and finally the sensation was lost completely. But the patient was still capable of emptying his rectum if he tried. He had, however, convinced himself that he could not get his bowels open unless he took enemata or such enormous doses of aperient that the fluid feces practically acted as enemata. He thus suggested to himself that his rectum was powerless to act by itself, true hysterical dyschezia being thus produced. In many cases no treatment was required beyond explaining to the patient the nature and cause of his condition and persuading him to make an effort to empty his rectum, which he must realize was quite capable of doing its work, but occasionally it was also necessary to reeducate his rectum with graduated enemata. In severe cases it was advisable to examine the intestinal functions with the x rays, a barium meal being given after the patient had discontinued taking his aperients.

Dr. Hurst said that the time table he gave ten years ago for the passage of food along the alimentary canal was nothing more than the average taken from numerous records obtained with the x rays, but it had unfortunately often been regarded as representing the normal standard, the slightest variations from which indicated the presence of intestinal stasis. The fallacy of this had been pointed out frequently, as the normal limits were very wide, but he still often saw patients who had been advised to submit themselves to colectomy or other drastic treatment as a result of an x ray examination which showed a somewhat slow passage, which was, however, well within the normal. He therefore thought it necessary once again to

describe briefly the evidence required in order to diagnose stasis in different parts of the intestinal tract. Ileac stasis should only be diagnosed if no trace of barium had reached the cecum six hours after the opaque meal, or if a considerable quantity of barium containing chyme was still in the end of the ileum nine hours after the meal, if the stomach was known to have emptied itself in three hours. If most of the barium was still in the cecum and ascending colon at the end of twenty-four hours, they were the seat of stasis, even if a little had passed to the more distant parts of the colon, but a faint shadow of the cecum was often visible in normal individuals even three days after the meal. If the splenic flexure was reached in twenty-four hours and the greater part of the barium was in the transverse colon at the end of forty-eight hours, there must be stasis in the transverse colon. Lastly, if at the end of twenty-four hours the greater part of the barium had collected in the pelvic colon or rectum or both, and in spite of this no desire to open the bowels was felt, dyschezia could be diagnosed. Apart from dyschezia the only common form of constipation of nervous origin was that resulting from anorexia. Anorexia was a common symptom of both neurasthenia and psychasthenia, and the deficient stimulation of the intestine which it caused generally led to a slow passage through the entire colon. Intestinal activity was also likely to be inhibited by depressing emotions in psychasthenia. There was, however, no evidence to show that the nerve exhaustion of neurasthenia had any influence on the bowels. Hurst was convinced that no such thing as atonic constipation existed, for tone and peristalsis were independent functions; and whereas deficient peristalsis was a common cause of constipation, the x rays had proved that atony of the colon was a rare condition, generally organic in origin and not necessarily associated with any disturbance in peristalsis.

SECTION IN TROPICAL MEDICINE.

The President, Professor G. H. F. NUTTALL, M. D., F. R. S.,
in the Chair.

Dietetic Deficiency and Endocrine Activity.—Lieut.-Colonel ROBERT McCARRISON, M. D., D. Sc., LL.D., F. R. C. P., of the Indian Medical Service, pointed out that the endocrine organs, regulators of metabolism, were profoundly influenced by dietetic defects. This fact had been demonstrated by experimentation on pigeons, guineapigs, and monkeys. Animals of these species were fed on six classes of deficient dietaries. The first was deficient in all three classes of vitamins and in suitable protein, and was disproportionately rich in carbohydrates; the second was deficient in B and C vitamins and disproportionately rich in carbohydrates and fats; the third was deficient in B vitamin and disproportionately rich in carbohydrates and fats; the fourth was deficient in A and B vitamins; the fifth in B vitamin only; the sixth in C vitamin only. The effects of these dietaries on the endocrine organs was attributable to three factors operating in varying combinations: 1, Deficiency of vitamins; 2, imperfect balance of the food with respect to proximate principles; 3, the fortuitous

occurrence of pathogenic agents in the body. The first two factors came into operation when the first three dietaries were used; they were aided in a proportion of cases by the third factor. The first factor was chiefly concerned in producing the results when the last three dietaries were used. It also was aided in a proportion of cases by the third factor. McCarrison summed up as follows:

1. Dietetic deficiency had a profound influence on endocrine activity.
2. All endocrine organs, with the adrenal glands and the pituitary body, underwent a greater or less degree of atrophy and depreciation of functional capacity as a result of dietetic deficiencies.
3. The adrenal glands and in males the pituitary body enlarged in consequence of dietetic defects; the former greatly, the latter slightly.
4. The adrenals were the most susceptible of all endocrine structures to dietetic defects.
5. The character of the adrenal enlargement varied with the character of the dietetic deficiency.
6. The adrenalin content of the enlarged adrenals varied with the character of the dietetic defect. It was in excess of normal when the food was deficient in vitamins, in proteins, and disproportionately rich in starch; it was below normal when the diet was scorbutic and also when concurrent infections were associated with dietetic defects.
7. Edema was invariably associated with massive enlargement of the adrenal glands in pigeons fed on autoclaved rice, but massive enlargement of the adrenals was not invariably associated with edema. This association bore an intimate relationship to the adrenalin content of the enlarged organs; when the content was high edema occurred in eighty-six per cent. of cases; when the content was low edema did not occur.
8. Fresh butter contained some substance which tended to protect against edema. This substance was not present in a coconut oil.
9. The hypothetical "antiedema substance in butter had a pronounced influence over the adrenal glands. It appeared to exert its protective action against edema by maintaining their adrenalin content at a low level.
10. Butter varied in its capacity to protect against edema. This variation was dependent on the quality of the cow's food; butter was richer in antiedema substance when the cows were fed on green fodder than when they were fed on dry fodder.

In a paper on the pathogenesis of deficiency disease published some time ago McCarrison suggested that edema was initiated by increased intracapillary pressure consequent on hyperadrenalinemia. More extended experience had caused him to alter his opinion. Recent work on the effects of adrenalin did not support this suggestion. It seemed more probable that an excess of adrenalin might reach the kidneys direct and interfere with the normal excretion of urine, thus favoring the retention of fluid in the tissues. A number of closely correlated facts pointed in this direction. Thus the adrenals were enlarged in human beri beri and their adrenalin content was high, the urinary output in human beri beri is small, although in general no disease of the kidneys was present; excess

of adrenalin introduced into the venous circulation inhibited the flow of urine (Gunning) and caused retention of sodium chloride in the tissues (Bulche and Weiss); a channel of communication existed between the adrenal glands and the kidneys, whereby the products of the glands might reach the kidneys without either dilution or oxidation in the general circulation, (Gow). finally a diminution of the flow of urine could be produced by the direct action of adrenalin reaching the kidneys by this route (Gow). Adrenalin thus appeared to control the excretion of urine; this being so, it was of great importance to be aware of the fact that adrenalin was in its turn controlled by the quality of the food. Other factors in addition to impaired excretion no doubt played their part in the causation of edema—impairment of endothelial function with associated alterations in vascular permeability, impaired metabolism of proteins and lipoids, and chemical changes in the tissues themselves, all of which were consequences of the disturbed endocrine function and of the disturbed metabolism which was the outcome of vitamine deprivation and malnutrition.

SECTION IN PATHOLOGY AND BACTERIOLOGY

The President, Professor J. LORRAIN SMITH, M. D., F. R. S.,
in the Chair.

Present Position of Cancer Research.—Dr. J. A. MURRAY, Director of the Imperial Cancer Research Fund, said that attention should be drawn to the bearing of the results of experimental work on the important statistical character of cancer, and its increasing frequency with advancing age in man and animals. It was not easy to say to what extent this peculiar age incidence was a consequence of the chronicity of the forms of irritation which most constantly led to the development of cancer and how far senile cellular changes were a necessary antecedent. The results of the culture of normal tissues *in vitro* showing practically unlimited powers of growth under suitable conditions would appear to relegate the senile failure of growth to a position of secondary consequence of accidental cell damage inseparable from the chances of life. If this were so, then the age incidence of cancer could be regarded as a consequence of the relative inefficiency of most of the forms of irritation associated with the origin of cancer in producing the disease.

In support of this view it could be noted that Dr. L. J. Dublin recorded a higher evidence of cancer in the experience of a New York insurance company among industrial policyholders than among those in easier social circumstances. The former were of necessity more exposed to various forms of chronic irritation than the latter. Fibiger had developed the same argument in reply to the objections raised to the cancerous nature of the growths in rats' stomachs, namely that they were not necessarily associated with old age. He claimed that the spiroptera infection was so potent a cause of the disease that the long duration necessary in other forms of irritation was not required.

(To be concluded)

Letters to the Editors.

INTERNATIONAL ASSOCIATION OF PNEUMOTHORAX ARTIFICIALIS.

NEW YORK, August 31, 1920.

To the Editor:

I have been requested by Professor Carpi, of Lugano, Switzerland, the General Secretary of the International Association of Pneumothorax Artificialis, to translate the following circular letter from the French which he had recently sent me, and to cause it to be published in as many of the American medical journals as will be willing to give it space. May I ask you to extend to it the hospitality of your esteemed paper, and believe me

Very truly yours,

S. ADOLPHUS KNOPF.

The International Association of Pneumothorax Artificialis, the work of which was paralyzed during the long war, desires to resume its activity by inviting all former members of the association to renew their subscription and all other physicians interested in artificial pneumothorax to send their names and addresses to Professor Umberto Carpi, Lugano, Switzerland, and to become members.

The purpose of the association is to spread all practical and scientific information concerning artificial pneumothorax. Although induced pneumothorax for therapeutic purposes has become remarkably prevalent it has remained a procedure applied only by physicians specially trained and experienced in this operation. For the convenience of the patients who may be obliged to change their residences, to know the names and addresses of physicians who practice artificial pneumothorax is of great value, in order that the patient may continue the treatment by periodic refilling. A complete list of physicians practicing artificial pneumothorax will be published with the scientific journal known as *Pneumothorax Therapeutique* for 1920-1921, edited by Carlo Forlanini. This list will be sent to all the members and to the most important medical societies, medical academies, and similar institutions of the different countries. In the journal will be enumerated and discussed all the world's literature on pneumothorax. The association will continue its labors under the policy indicated by the illustrious master and creator of artificial pneumothorax therapy. As soon as the finances of the society will permit the renewal of the publication, the editor will put himself in communication with the editors of such medical journals of other countries as are publishing articles on artificial pneumothorax. For the present these are *die Sonderhefte des Tuberkulose Centralblattes ueber Lungenkollapstherapie* and the monographs in the journal *La Tuberculosi*, Rome.

The subscription price of five francs should be addressed to the General Secretary, Prof. U. Carpi, Lugano. The subscriber is entitled to receive the journal with the list of names. Those who desire to receive the monographs of the journals indicated should make a request for them to the General Secretary, who also has an international exchange office for all publications appertaining to artificial pneumothorax. Summaries in English, French and German on any topic relating to artificial pneumothorax will be gratefully received and published.

PROF. U. CARPI, General Secretary.

LUGANO, August 10, 1920.

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Original Communications

PERSISTENT VOLUNTARY MUTISM.*

BY ALFRED GORDON, M. D.,
Philadelphia.

Mutism is a form of speech disturbance which may be encountered in a large variety of conditions. Hysteria is the affection in which mutism is most frequently found. In the works of older writers facts are recorded showing sudden recovery from mutism; they all have reference to cases of hysteria. In this affection the condition may develop suddenly after an emotional disturbance or gradually after a period of aphonia, when the patient is still able to converse but in a low voice. Occasionally traumatism or an infectious disease is likely to be the cause of mutism.

Among other causative factors of mutism may be mentioned abulic inhibition in psychasthenia and the psychoses. Mutism is frequently observed in the insane. It is common to see in them an obstinate silence extending over months and years. The depressive cases usually present a mutism of long duration together with absolute immobility. In the cases of negativism, such as is observed in dementia præcox, mutism may be one of the negativistic manifestations. In a patient under the writer's observation, after the birth of her first child and after a period of slight confusion accompanied by mild delirium, a state of resistiveness developed which soon invaded the faculty of speech and mutism followed. Not only words but even sounds are never emitted by the patient. She is absolutely silent but at times movements of the lips are observable as if she was making an effort to reply to questions asked. The mutism has been in existence for nine weeks and there is no indication of a prompt return of her voice.

That organic cerebral lesions are likely to produce aphasic manifestations and complete mutism is too obvious to dwell upon. In the recent war traumatic cases have been observed in which the individuals lost consciousness. After the return of consciousness amnesia or deafness was noticed and when the injured attempted to speak they failed. As there was no intervallary period and the loss of speech was immediate, there can be no hesitation as to the hysterical character of their mutism. Emotion probably played a preponderant rôle.

Mutism in children, apart from the psychoses, is rare. The following case presents an example of

mutism occurring in a child of thirteen previously free from morbid phenomena. It also presents a group of phenomena in which the mutism developed concurrently with profound changes of personality. The mutism is persistent in spite of the fact that the patient is fully conscious of it.

CASE.—Boy, A. S., thirteen years of age, heretofore with a school record of average intelligence, happened to read a book containing a story of a man who gradually lost his speech. Soon his parents noticed that the boy talked very little, only what he was obliged to say. Rapidly he ceased to speak altogether. Not only his speech but his voice could not be heard in the house. During a period of six months the condition remained unaltered.

Presently he was totally mute. No word or sound was ever uttered by him. Occasionally he could be heard laughing in his room; he did it only when nobody was around him and the sounds reminded one of those uttered by a wild animal—they did not resemble those coming from a human larynx. They were brief, unusually loud and rough—not continuous but sharply interrupted. He indulged in such laughing without the least provocation and, as mentioned before, exceptionally.

All attempts to make him speak utterly failed. He fully understood when he was spoken to and was always willing to give replies to questions in writing. Asked why he did not speak, he shrugged his shoulders and wrote down, "I don't know." Asked whether he would like to speak, he replied, "No." Asked whether he would ever speak again he replied in writing, "Yes," but when asked to name the date he shrugged his shoulders and wrote down, "I don't know." Asked again whether it would be more than a year, he wrote, "Yes," but when asked, "Will it be less than two years?" he replied, "I don't know." To all efforts to make him admit the necessity of communicating with fellow beings by speech he invariably persisted in shrugging his shoulders and in writing, "I don't know." He spent his time in his room in reading or writing. He read anything that he could lay his hands on but he was especially fond of serious subjects concerning industry and development of the cities in the United States. At my request, for the purpose of testing his ability of fully grasping the essential features of a serious article, the patient wrote down a résumé of two papers published in the *Saturday Evening Post*. It was presented by him in a fairly logical manner and in fairly correct English.

* Read before the Philadelphia Psychiatric Society, May 14, 1920.

He was so eager to spend his time reading that all the money he succeeded in getting from his parents he used for purchasing magazines and newspapers. In buying the latter he did not speak but rushed to the stand, handed over the money, picked up the article purchased, and left at once. All his acts, including walking and eating, were done in an abrupt and jerky way. When he was through eating he rushed upstairs with great speed and locked himself in his room, went to bed and abandoned himself to his favorite occupation, reading. Hastiness and rapidity were seen even in reading; he devoured the books, according to his parents, and would read two or three books in a day. Unusual rapidity was noticed in eating. He never allowed anyone to wait on him. Should his mother put some food on his plate, he would not eat it; he must help himself and before doing so he wiped the plate two or three times to make sure of its thorough cleanliness though he would pile on it indiscriminately anything he could get hold of to eat. Occasionally he would sit at the table with his parents and the other children, and then no one could wait on him: he reached for the food before anyone else had time to sit down, and as soon as he had finished he rushed upstairs to his room. Not only did he eat rapidly but he ate abundantly and ravenously, more than anyone else, and more than he ever did at the time before the mutism had developed. As the parents said, he did not eat like a human being but like a wild animal.

In his room he kept the windows and door hermetically closed, placing paper and rags in each crevice and opening that he could find. He smoked cigarettes only in his room. The air was suffocating when one entered and the only time that ventilation was possible was when he was out on his errands of buying a paper. When he was in the room he would never permit a window or door to be opened and when he observed that the paper or rags were removed from under the door he became excited and immediately replaced them; with violent gestures and movements of his hands he expressed his dissatisfaction and threatened bodily injury. While in the room he seldom sat on a chair, but was always found in bed.

He was not particular about his personal appearance, although he was always careful in having his collar and necktie on when he expected me to visit him. He slept in his drawers but would not have underwear on during the day and in the coldest days of winter he would go out without undergarments. From a former careful and neat boy he became slovenly, as he did not care how he appeared before strangers on the street and before the magazine dealers whom he saw daily when buying his papers. Questioned on this subject he wrote that he did not know why he changed at all. When asked why he did not appear well dressed he gave the reason, "Since I will not speak to people," as his written reply.

Beside the newspaper stand, the only other place he liked to go to was the cinema. Among the pictures he preferred those which dealt with strong scenes, stories of the woods, shooting, and attacking. He did not care for sentimental stories.

In his relations with members of the family it was interesting to notice a pronounced want of affection. In him there developed a particular dislike and even an open antagonism toward his twin sister; at times he showed hatred and not infrequently he attacked her. Interrogated on the subject he wrote that he did not believe she was his sister and that he did not wish to have anything to do with her; she could not possibly be his twin, he said.

He did not show any trace of affection toward the other brothers and sisters; he never went near them, refused to spend any time with them and always declined their invitation to go to the cinema or to play together. He never looked at them. If they happened to be in the room when he entered, he immediately left. Toward his parents he was totally indifferent. He would never carry out an order given by them. He was afraid of his father because the latter threatened bodily punishment. The supplications of his mother were totally ignored by him and were of no avail as to the correction of his changed habits or with regard to his mutism. It is well to remember that prior to this period he was fond of his relatives and showed toward them the affection of the average normal child. Presently he avoided them, and was not concerned at all if an illness occurred in the house or if an accident occurred to anyone in the family. The open enmity and antagonism to his twin sister, the indifference to his other sisters and brothers, total lack of consideration for his mother, and absolute want of affection for his father have been the most striking features since the condition developed.

His innermost desire to be detached from his family was shown in a letter which he wrote to some distant relatives at the pressing and repeated insistence of his mother. After expressing his pleasure at their safe arrival and wishing them a happy life in the future, he terminated the epistle by saying, "Regards to all," signing, "Anna, David, and the whole family except myself."

The boy's previous medical history presented no striking peculiarity as far as could be ascertained from his parents. However, enuresis had been present since infancy; he still continued wetting his bed every night. He was born at term, commenced to speak and walk at a normal age, never met with an accident and never sustained an injury. He was considered a strong and healthy boy, and he went to school and made progress as the average boy. Nevertheless he was not fond of play, preferred to stay home and was selfconscious and timid. He was very sensitive to remarks about his personality or to any offense. He was shy in the presence of strangers. He did not show a penchant for any special play or study or other activity. He exhibited no peculiarities in his general behavior or special tendencies. There were no vicious or defective habits.

The physical examination of the boy gave negative results. Station, gait, motor and sensory apparatus, and pupillary reactions were all normal. Hysterical stigmata were absent. The cardiorespiratory apparatus was normal. Larynx, pharynx, vocal cords, showed no lesions. The family history was

negative as far as constitutional diseases were concerned. The parents were of average intelligence and the other children presented the average type of apparently normal children. Although serological tests were not made, nevertheless there were no clinical indications whatsoever to suspect an underlying luetic basis in the parents or in the physical characteristics of the children.

To sum up, we were dealing with a young individual who, along with normal features in the intellectual sphere, presented certain abnormalities in the field of judgment and in the domain of his affective faculties. The abnormal manifestation of absolute mutism developed rapidly after reading a story on mutism. No power of persuasion or argumentation succeeded in breaking the disorder. One witnesses here not only the development of a speech and voice disorder, but a decided change in the entire personality. On one hand the boy's attitude toward his parents and nearest relatives became distinctly altered; not only did he disregard their advice or orders, but he lost all sense of obligation, of obedience, of respect, of affection, and there even developed a sense of enmity and hatred toward one of them. Moreover his behavior, his manner, his failure of comprehending the discussion of his mutism, his contradictions in replying to questions concerning the disorder, all denote a profound change in a boy who previously presented a type of individual of average intelligence.

Although the mutism was the most conspicuous morbid phenomenon in this case, nevertheless it was not an isolated manifestation. It was associated with a number of other abnormal symptoms. The latter were not the result of and are not focused around the former. They were manifestations of a different order. The mutism was evidently due to an inhibitory functional paralysis of cerebral nervous centres which controlled speech and emission of sounds, affecting not only the highest cortical levels but also the unconscious mechanisms depending upon the middle levels (Grasset) as well as the muscles themselves connected with speech and sound. May we not be dealing here with a paralysis due to an inhibition or to exhaustion produced by excessive stimulation of the nervous system, and in this particular case through intensive reading of a story concerning a man who ceased to speak? Further analysis shows that only the motor element of speech was involved. Since the sensory speech was intact (he understood spoken or written words), the motor centre of speech was evidently separated from the ideative centres and consequently from the remaining cortex. The function of the associative fibres going from the entire cortex to the motor speech centre was disturbed or interrupted.

The mechanism of the interruption of function in this case is apparently intimately associated with the deep impression caused by the reading about the loss of speech. A question arises: Are we dealing here with a case similar to those observed after deep emotions? A multitude of cases of mutism have been reported in the last war following explosions in the vicinity but without material injury to the individuals. That in civil life strong emotions

may be followed by aphonia has been known from time immemorial. Hysterical aphonia and hysterical mutism are well known conditions. In the present case the patient was totally free from mental stigmata of the great neuroses. The emotional element was equally not of the character usually observed in hysterical aphonia or mutism as far as the suddenness of their appearance was concerned. On the other hand other symptoms suggest the possibility of hysterical mutism in that there was no trace of word deafness or word blindness; it was a motor aphasia in the extreme degree. Malingering is also not to be considered by virtue of the fact that fraud and deceit have no conscious or unconscious motive in this case; there was no purpose of gaining a certain end. Besides, the change of personality described above is a sufficient guarantee against the assumption of an intentional or conscious focusing of a malingering attempt upon one feature of speech—mutism.

The peculiarities of behavior, of conduct, of relationship to his parents and brothers and sisters, of judgment concerning his faculty of speech—all of which developed simultaneously and parallel with the mutism—designate a disability indicative of a profound mental disorder notwithstanding the fact that the boy was able to understand printed matter, that he was able to become interested in certain subjects, that he was able to answer questions in writing. The character of his acts and the total inability to criticise his own abnormal acts, his failure to observe the striking contrast between his present mode of acting or feeling and that of the former normal condition, the impossibility of appreciating the radical changes which have taken place in every detail of his life, are all evident proofs of the boy's perverted adjustment as a result of a change in his personality.

1812 SPRUCE STREET.

THE NATURE AND CAUSE OF STAMMERING.

BY MEYER SOLOMON, M. D.,
Chicago.

The terms stammering and stuttering are used synonymously in this paper. The speech apparatus proper consists of two portions: 1, the articulative organs, used in articulation or the pronunciation of consonants (the lips for labial, the point of the tongue for dental, and the back of the tongue for guttural sounds); and, 2, the vocalizing organs, consisting of the laryngeal apparatus, used in phonation, vocalization, or more plainly in pronunciation of vowels. Furthermore, changes in respiration are constant accompaniments of the act of speaking. Both articulation and phonation are under voluntary (motor) control, as is also, to a certain degree, the respiratory apparatus (chest movements).

Briefly summarized, the nature and cause of stammering can be presented as follows: The stammerer suffers from nervous excitability and emotionality; this expresses itself, in the stammerer,

in a speech disorder; the speech disorder in the stammerer is produced as the result of a definite series of phenomena, all of which are under the stammerer's control. First, there is the tendency on the stammerer's part to hurry, virtually to rush headlong and precipitately into speech expression of his thought. So great, so intense, so acute is this haste, that the stammerer really thinks faster than he can speak, and he endeavors to say immediately that which he has in mind. As a result of this, he throws his speech apparatus—either the articulative (for consonants) or vocal (for vowels) portion—into sudden, more or less, violent spasm. Respiratory spasm is commonly present in either case. In his blind rush the stammerer tries to pronounce a vowel (laryngeal sound) with his articulative organs—that is, while his speech apparatus is in the position for articulative (consonant) expression; or, he makes efforts to produce articulative sounds with his vocal (laryngeal) organs—that is, while his phonation apparatus is in action.

As a consequence the stammerer either maintains a fixed articulative (consonant producing) position and endeavors, while in this position, to pronounce a vowel; or, he keeps his vocal (laryngeal) apparatus in continued action while battling to proceed hurriedly and stubbornly to the pronunciation of a consonant. Both of these feats are impossibilities for any human being. One must cease articulative (consonant producing) efforts to pronounce a vowel, just as one must stop vocal (vowel producing or laryngeal) efforts to pronounce a consonant. The stammerer unthinkingly persists in his misdirected efforts to do the impossible—that is, to pronounce a vowel with his articulative organs (lips, tongue) or a consonant with his vocal organs (larynx).

In his insistence in this direction the stammerer may bring into play much of his voluntary motor system and assume, during the act of speaking, various accessory or supporting attitudes and postures, spasmodic in nature, just as one would in hard work or fighting or running. The stammerer may become exhausted from his efforts. Finally, in despair or by compulsion, the stammerer gives up the useless struggle, relaxes the portion (articulative or vocal, as the case happens to be) of his speech apparatus which up to that moment has been in spasm, and only then, often to his great surprise, is he able to proceed to the pronunciation of the next sound.

The stammerer wishes to say the word but. He begins, as he should, with the labial *b*, shaping the articulative organs to this end. Now, to pronounce the second sound, *u*, which is a vowel, the vocal (laryngeal) apparatus must be brought into play. The stammerer, however, is in so much of a hurry to pronounce the vowel *u*, that, not knowing just what he is doing, he does not take the time to relax his articulative organs (in this case the lips) before proceeding to the pronunciation of the succeeding vowel. Instead of this, the stammerer insists in pronouncing the vowel *u* with his mouth fixed in the position for the pronunciation of the labial *b*. He repeats the effort over and over again. The stammerer, in this case, is thus unable to proceed to the pronunciation of the vowel *u* until, for one

reason or another, he ceases efforts at articulation (in other words, opens his mouth) and permits vocalization (from the larynx). The inability of the stammerer to proceed from the vowel *o* (laryngeal apparatus) to the consonant *v* (articulative organs—tongue and lips) in attempts to say over, can be explained in an analogous manner.

The mental state of confusion and fear, with timidity, shame, embarrassment, feeling of inferiority, and the rest are but aftereffects. However, fear of stuttering in a stutterer leads to increased nervous excitability and hence to increased efforts to do the impossible, as explained above. Anything—fear, shame, embarrassment, malnutrition, overwork, or insufficient sleep—which enhances the stutterer's nervous excitability makes his stuttering or tendency to it worse. The therapeutic indications are simple, are clearly indicated, and will be discussed in a separate communication.

5501 PRAIRIE AVENUE.

NATIONAL MORALE IN RELATION TO HYSTERIA, MILITARY AND INDUSTRIAL.*

By TOM A. WILLIAMS, M. D.,
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The high morale which was preserved in the French Army, in spite of the discouragement of the rest of the world, must be largely credited to the work of the French neurologists. It prevented the defection of men on account of psychological inadequacies; other men learning thus that the functional nervous disorders would not get them out of the army, stiffened themselves against this temptation. In the British Army the problem had become unmanageable; 100,000 men were let go on account of functional nervous disorders, uncured because of the antiquated concepts by neurologists in that country. Later the British rather crudely imitated the French methods.

An uncured neurotic is a trouble maker, while a man who is cured is not only grateful but becomes an educational force against similar troubles in others. Much of the dissatisfaction among the laboring people in England can be attributed to the unskillful management of the neurologists, permitting these thousands of men to leave the Army and pervade those around them with discontent.

Insurance against what had happened in England was early instituted in the American expeditionary force, and a competent and adequate staff was provided to deal with functional nervous diseases. They had begun to do valuable work when hostilities ceased but the real demonstration of the value of good neurologists to a nation was given only by the French.

The great frequency of hysteria among soldiers has been thoroughly established during the recent war. About ten per cent. of the casualties bear the stamp of functional nervous disorders and the vast majority of these were hysterical cases. This is true not only of battle periods, but also during times of relative quiet, although the rate rises in

*Read before the American Medico-Psychological Association.

anticipation of important attacks. The depletion of the ranks is serious enough in itself, but when it leads to extensive discharge of trained soldiers from the army it becomes a great danger to man power.

The loss of man power is, however, the least important disadvantage of hysteria improperly dealt with. The effect upon other workers of thousands of incapacitated men without lesions is most pernicious, for the contagiousness of their example is pervasive beyond expression. This, too, was discovered by the British, but only after it had given rise to serious disaffection among the workers. The sight of what they called shell shocked men, providing apparently horrible examples of what might happen to themselves were they drafted to France, was not calculated to encourage the spirit of belligerency. Furthermore, 100,000 chronic invalids were a drag upon the national resources. When this was found, herculean efforts were made to recuperate these men at enormous expense, but with only limited success in spite of the exercise of very high skill. Had a modicum of this skill been permitted in the Army itself, no such problem would have occurred among the British.

The French entirely obviated these disadvantages by applying the neurological skill where its efficiency was at a maximum, namely, in the fighting zone itself, so that soldiers with functional nervous disorders were immediately differentiated, and treated where possible. Even where this could not be done, no discharge was obtainable, but the soldiers were sent to neurological hospitals in the interior until such time as organizations for their intensive treatment came into operation. In this way the French nation was spared the lamentable spectacle of complaining men with grievances against the Army and the country which had discharged them uncured and only too ready to disseminate alarm by emphasizing the awful horror of war to timorous lay people already exhausted by the privations through which they had to go to maintain the Army.

MANAGEMENT OF WAR HYSTERIA.

The treatment of hysterical manifestations depends upon one principle, namely, the replacement of the patient's morbid mental attitude by a normal one. It is a reconditioning, a substitution, a re-education to which the patient has to be persuaded.

The means of persuasion are innumerable. The most successful in the hands of one therapist are not necessarily those which should be employed by another. The choice depends far less upon the nature of the hysterical symptom, or even upon the nature of the patient's makeup, than upon the temperament of the therapist himself. Some men are most successful when they employ methods which in reality are pure suggestion; others are more successful if they use methods which make the patients suffer. Others again cure more cases when they are permitted to elaborate a systematized re-education of the patient.

Suggestion.—The methods which are scarcely more than direct affirmation and suggestion, are only of utility during the whirl of the dressing station at the front, at a time when the man's belief that he is justified in reporting sick is not at all

firm. The diagnosis can be made swiftly and easily. To restore the patient's military capacity it suffices to assure him confidently that his trouble has disappeared and that there is no reason for its return.

Torpillage.—The removal of hysterical symptoms by the infliction of suffering is applicable to perseverators and simulators rather than to the general hysterical patients. It is a method most readily employed by those physicians who have not the patience and the spirit of organization required for more systematic treatment. It is, of course, a very rapid method, saving a great deal of time for the doctor, and providing a great economy of man power, in that a patient treated in this way can be restored to the service in less than a month, whereas a patient in whom the more moderate method of influence and reeducation are employed required several months to become fit for service.

The severe and painful methods of treatment, however, are greatly restricted in utility unless they are completed throughout the army, unless the assurance that they will be employed is known to the soldiers, and unless their use is sustained by public opinion. When the chance of evading this treatment exists either because the patients knew that the doctor dare not push it or on account of fear of interference by political appeal, the treatment loses its authority and becomes a very painful ordeal for the doctor who uses it. Besides not every man has the tenacity, the courage and the skill required for its utilization. Mere relentlessness does not suffice. The doctor must know when to cease the painful stimulation and invoke the patient's own will in the removal of his disability, for intemperate zeal and bungling brutality inevitably produce a spirit of vindictiveness in those subjected to the treatment which has a detrimental effect upon the neurological services in general.

Reeducation.—Torpillage should never be attempted except in thoroughly successful hands. Accordingly, it is necessary to have recourse to the method of gradual reeducation. The principle utilized to effect the metamorphosis of the patient's mental attitude by this procedure is that of the building up of hopeful expectancy by the giving of examples of cure, and by other means calculated to create an atmosphere of confidence. The subject is more fully gone into in my forthcoming book on the disorders of the nervous system in warfare and also in a recent article (1).

PROPHYLAXIS OF WAR HYSTERIA

The best preventive of hysteria is that the soldiers realize that most of the functional nervous disorders are quickly cured, and give rise to no future diminution of military value; that shell shock rarely occurs even in men stunned by explosions; and that every man will immediately meet with skilful diagnosis and sympathetic treatment if he has to be taken from the line, but that any attempt to evade duty by the assumption or exaggeration of symptoms will be quickly detected and firmly dealt with.

I consider that the excellent morale of the French Army, under the most appalling conditions, was made possible only by the skill, fidelity and determination of the French neurologists, who persist-

ently kept before the soldiers the fact that functional nervous disorders should all be recovered from, and that no one could be absolved from army service because of them. However, so incomplete was the understanding of the nature of hysteria by the laity, even in France, that repeated attempts were made to interfere with the labors of the neurologists charged with the restoration of obstinate hysterics to active service. Emphasis was laid upon the severity of the treatment, by agitators, who would not or could not see that a temporary suffering necessary for permanent welfare was not only legitimate but essential. Those who never thought of objecting to the suffering contingent upon a surgical procedure, held up their hands in horror at the much less painful procedure necessary to overcome hysterics with contractures, persistent paralysis, deafmutism, stammering, tremor, convulsion, incontinence of urine, pseudogastropathy, or what not.

Subsequent to a court martial implicating Dr. Clovis Vincent, the newspapers so violently attacked his work at Tours that the intensive treatment had to be given up. This in spite of the fact that nine hundred men who had previously encumbered hospitals for months were returned by Vincent to the army in less than a year.

The newspaper *La Victoire* then attacked the establishment at Maison Blanche and destroyed its usefulness, in spite of the complete exoneration and high praise expressed by Gustave Herve, the editor, subsequent to a visit incognito to the hospital. He then wrote as follows:

"Our readers have certainly not forgotten unfavorable criticism of our neurologists. Because of what I had heard from different sources, I went to the Under Secretary of State of the Service de Santé and asked him to put an end to the cruelties that certain doctors were guilty of toward our wounded soldiers. In reply Mr. Justin Godart said: 'Let us arrange a day and without announcing our arrival we will go to the Maison Blanche where these horrors you have told me of take place.' We paid our visit together, and I will give a short account of what we saw.

"About sixteen kilometres from Paris is situated a hospital which before the war was used for the treatment of the insane of the Department of the Seine. It is called the Maison Blanche.

"The hospital was disinfected. It is a beautiful place with large courtyards and garden, large windows giving plenty of light and sunshine can penetrate. It is here that the wounded are cared for while waiting for their artificial limbs with which everyone is provided. In three separate pavilions the soldiers suffering from nervous diseases are treated by nerve specialists.

THE WOUNDED.

"We were taken first of all into a large room where under the direction of Professeur Amar the artificial limbs are suited and reeducation exercises are given according to the methods of Dr. Amar, which greatly diminish the incapacity of the wounded. The artificial limbs are as perfect as possible; the doctor himself fits them with the greatest care. After many experiments the manufacture

of artificial limbs has been standardized and soon the wounded will not have to wait for them as they have done in the past.

THE NERVOUS CASES

"The effects of the war upon the nerves are sometimes very unexpected. Sometimes they are the direct results of the wounds, and sometimes there appears to be no direct reason for them.

"The patients are cared for in two large pavilions furnished with beautiful white beds, and with large windows. Some have lost the use of their legs, and others walk bent double; this one was deaf, dumb and blind, but already he sees, hears and is beginning to speak. A Zouave trembles so that he cannot stand up. The toes of a soldier were entirely turned back (*retournés*). This would all be very terrifying if the doctors did not assure me that all these unfortunates are curable, and if I had not seen those who were nearly cured.

"The mechanical treatment is unfortunately rather rough; it is necessary to reeducate the limbs which do not obey the will and the necessary muscular tractions and those that do not understand. They are in fact very painful for the patient who does not always understand how necessary they are.

"I questioned all the patients one after the other quite openly; some know, some do not understand, and it is certain that when these patients told their families of the treatment they had received and which they were made to undergo, these misinformed relatives became agitated and judged with severity the tortures the soldiers had undergone.

"In order to prevent the natural but very unfortunate judgment which the best intentioned patients can give about the procedures which they cannot explain, it is necessary to limit the visits of the relatives. It is necessary for them to know that if their children suffer, this suffering is necessary and that the results legitimate it.

"The patients I have met have talked with great freedom, with one or two exceptions, accept willingly the care given them.

"I have even seen the cells in which the patients are placed who are in need of complete isolation. They do not at all resemble the cells of civil or military prisons. There is absolute solitude and it is not at all gay but it is clean and light, the doors have glass in them, there is good fresh air and a comfortable bed. No essential is missing and I am only too happy to say that my apprehensions were unjustified.

"As for the patients they should wish to be cured as much as we wish it for them and so the only possible means of cure must be accepted. The parents should have no fear, they should understand that one wishes to return to them and to the nation their children sane and healthy and that there is nothing to do but to leave the matter in the hands of the doctors specially trained for the diseases. Every one must be patient and have confidence and it is not at all necessary to say to these doctors who undertake the treatment of the nervous patients that gentleness would accomplish more than violence; it seems to me that they do their work with science and kindness.

"The above is the account of what I saw. I hope that the relatives of these patients who know our desire to discover the truth will now be consoled and reassured."

On account of the likelihood of misunderstanding by families and friends causing friction and perhaps public agitation which would interfere with the task of physicians and the efficiency of the service, patients needing treatment by isolation and reeducation should be sent to regions inaccessible to families or other sympathizers.

In addition it is important that such a centre should be away from drinking shops, cafés, or any amusement, and that it should be protected from all kinds of smuggling. The less distraction the patients can find outside, the greater the impression made upon them by the atmosphere of the service itself, and the desire to enjoy again the pleasures of which they have been deprived is an additional stimulus to their own efforts to recover. There is every reason to found such establishments near the front lines, and on no account should patients of this description be returned to the United States. On the contrary, there should be a widespread understanding that such patients will remain in the military hospitals near the front.

On the other hand, the impression must not be allowed to originate that these hospitals are centres of coercion. For, although strong persuasion is needed to arouse the patients' efforts at cooperation, and severe discipline is often imposed, yet the object is primarily therapeutic, and for the patients' own good, as well as having the object of restoring a soldier already trained to his duty, and of preventing the demoralization which would occur if psychoneuroses were found to be an easy way for the perverse willed or cowardly to evade service or responsibility. A mutiny might be organized by a spiteful patient with ability. To prevent this, such hospitals should be under military law. When sent back to the regimental depot, patients who have been cured of hysterical attacks or the simulation of them are likely to manufacture a relapse, hoping that it will catch unawares the medical personnel without neurological knowledge.

The nature of industrial hysteria and its management has been considered by us in many publications, generally under the rubric traumatic neurosis. Latterly the method I have advocated of using the neurologist as a referee has been employed in Washington, much to the facilitation of adjustments and the avoidance of litigation.

Even as late as 1918 further attacks were launched against the very gentle methods employed in the centre of the seventh region, to which then nearly all the recalcitrant neurotics were being sent to undergo a cure by the progressive persuasion which was the method adopted by Roussy and Boisseau there.

SOLDIERS AND CIVILIANS

Campaigns of this kind are to be feared in any country. They have occurred in the past against surgical hospitals; even now they continue against many kinds of scientific research, especially that occupying itself with experiments upon animals.

No more need be said about this sociological question, as its merits are fully set forth in various pamphlets issued both in England and America by research defense societies and medical organizations.

The agitation against the French neurological centres has perhaps been in part aroused by the zeal with which some French neurologists have pursued their ideal of duty to the country and the cause of the Allies, for some of these men have thought less of their personal relation to possible blame than they have thought of the welfare of the patients, and hence they have failed to safeguard themselves against unjust aspersions. The best weapon against unjust agitation, is, of course, instructed public opinion. It is this which has sustained the practice of surgery in hospitals so that it is no longer a question of debate, and it is this which has sustained in the main the physiological experiments on animals.

In the United States, public opinion is already in a better position to comprehend the complex and difficult problem of the care of the psychoneuroses than it is in England, for instance. For in America the public mind has been saturated for twenty years by the facts of the influence of mental states upon bodily conditions, and by the knowledge that there are such things as psychogenetic disorders. This is already a step in advance, even though it has been taken in the main at the instigation of protagonists who inculcate also erroneous doctrines, and carry the psychogenetic factor to absurd lengths. This, however, is because of their ignorance of the facts of psychology and medicine when it is not from motives which are far from disinterested. We are referring, here, of course, to the teachings of the numerous mental healing cults, whose influence has been far more pervasive than most doctors realize. In order to amplify the information spread by them, it is only necessary to rectify that portion of it which is erroneous, by giving to the public clear and well illustrated examples of the limits of psychogenetic possibilities. This, of course, cannot be done in a day, but from each judicious presentation there should emanate a few individuals who will form an enlightening focus which would gradually spread its influence in the community where they live.

The present reporter has, for the past ten years been endeavoring persistently to spread, not only in the medical profession but among the laity and especially the women, the principles and the limitations of psychotherapy, and in some of the communities in which this has been done, the results are already apparent. One of the practical corollaries of this teaching has been the necessity of treating psychoneurotics, not by means of laymen or even psychologists, but by physicians only, for it is only they who are sufficiently trained to appreciate the physical factors which are constantly changing in every case, and without an appreciation of which psychotherapy often proves hurtful rather than beneficial.

The mental hygiene movement, too, has done something in this direction, but as it has been occupied

in the main by the grosser practical problem of the prevention of the physical states which produce alienation, it has not yet attained the influence which it will have with reference to psychogenetic disturbances. However, through mental hygiene organizations it will be possible rapidly to reach the public now, and to instruct them in advance concerning the rôle of the military doctor in dealing with the numerous psychic affections engendered by the continuance of the war. It will be much better to do this in an organized, sane and temperate fashion through a well balanced committee of mental hygienists than to allow it to be done by medical journalists who are prone to forget their educative function in pandering to sensationalism and mysterymongering in order to obtain higher prices and a wider circulation for their effusions. The facts, on the contrary, should be presented in the most simple, clear and demonstrative fashion; and the theme, which is full enough of sensationalism, should be shorn as much as possible of that element. The mode of presentation adopted by Dr. Addington Bruce, of Cambridge, and Dr. Evans, of Chicago, in these explanations cannot be taken exception to, as both of these writers present their subject as truthfully and sanely as is in their power.

I am aware that it is a dangerous field to permit public discussion to enter into, and that the task is difficult; but in view of what has happened in England, and to a far lesser degree in France, it seems imperative that we should not adopt a *laissez-faire* attitude towards the possibility of a situation which foresight may be able to prevent, and which threatens to such a degree that we can be certain of its occurrence unless something happens to prevent it. We cannot afford to leave to chance the occurrence of more favorable circumstances. By intelligent prevision, we may be able to prevent what we fear. A good deal will depend upon the ability with which the preventive measures are undertaken.

The public already recognize the need of a certain amount of suffering in the cure of disease by surgery, and especially in orthopedic work. The difficulty of explaining to them that the cure of psychoneuroses cannot be accomplished upon a bed of roses should not be insuperable. Furthermore, as the public has already accepted the principle of compulsory vaccination which entails temporary suffering for the prevention of disease, there is no logical bar to its accepting the principle of some degree of temporary discomfort or unpleasantness for the prevention of nervous disease. Further, as the public has long ago accepted the principle of compulsory education, which is, for the child, an exceedingly unpleasant experience as compared with the free life it might otherwise lead among the alleys of the city of the hedgerows and streams of the country, there should be no logical bar to a general acceptance of the principle of compulsory reeducation for the men who have fallen into a condition which imperatively requires it.

To the objection that medical science is not perfect, and that medical men are very far from it, and that some doctors are negligent, some incom-

petent and some harsh, we can reply that no one proposes to abolish the school system because some teachers are incompetent, negligent or harsh, and nobody advocates the abolition of surgery because some surgeons blunder and others operate merely for profit. In every art we have to set against the human imperfections the many excellencies and accomplishments; and so in the art of reeducational psychotherapy.

The war has furnished us with statistics which show that in the best hands with early treatment under good conditions, the recovery rate approaches one hundred per cent., and that even old, obstinate and resistant cases are cured in a proportion from eighty-five per cent. to ninety-four per cent. when the conditions for doing so are properly organized. Even men not of the highest skill, practising under conditions far from ideal, are able to restore to health about seventy per cent. of the psychoneurotic soldiers who pass through their hands. It is quite true that there are certain areas which are regarded as dumping grounds where the patient has little hope of improvement; but that simply affords an illustration of the wrong man for the job, and it is a situation which should be easily avoided in the American service, which has at its disposal a very large number of men, so that a man who does not succeed with the psychoneuroses can very easily be transferred to other work.

Some of the facts regarding the question in which it might be desirable to instruct the public are as follows:

As the motive of many men with psychoneuroses is, at root, a desire to avoid their duty, some of them will resort to any expedient to prevent themselves from being cured, provided that the said expedient does not give them the air of dodging an obligation. In France some of the men, after realizing that the treatment will be painless and that once in the hospital for treatment they have every chance of being cured in spite of themselves, have adopted the dodge of refusing to enter the hospital, basing this refusal upon the principle of the liberty of the individual to choose what treatment he shall give to his own body. This implies a refusal to submit to a medical or surgical prescription. This is regarded as a civil right, and even in the military service, the right has not been abrogated. This civil right is, however, abrogated in cases where the question of mental soundness enters, provided that there is danger to the patient himself or others. In the case of a psychoneurotic there is nowadays no dispute that the mental factor is the primary and all important one; so that fundamentally we are dealing with what in reality is an instance of mental unsoundness—if we are entitled to give that term to social inadaptability.

Where the defense of the country is concerned such behaviour as a fatuous refusal to take steps which will end in making oneself fit for service can be stigmatized justly as a danger to the nation. Furthermore, there is no doubt that the life of these men uncured is, if not a danger, at least a serious detriment to themselves and their relatives. They become a veritable nuisance to their community, absorbing an untold amount of wasted

sympathy, besides using up material resources which might be better applied in the upbuilding of the country. Such men, too, live under a sense of grievance against a community which has permitted them to lapse into a state of desuetude, and, worst of all, they form a bad example as to the possibility of such serious consequences happening to any one. Thereby they propagate a false impression as to the sequences of warfare which are bad enough without adding unnecessary contingencies.

These very men, on the contrary, after they have been cured are full of gratitude and recognition for the transformation which they have undergone. The letters written to the doctor who has cured them are only a few of scores expressing the intense personal satisfaction derived from their restoration to active participation in the affairs of life. No longer a cowering neurotic, the patient becomes happy to take his place beside his comrades, even in the danger zone, proud of the consciousness that he is a man once more and able to take part in the defence of his country. He learns how false has been his view of the beneficent physician who has cured him in spite of himself. He has found that the school which he dreaded was nothing like so hard as he had anticipated, and he is grateful for the privilege of having been chosen to pursue the salutary discipline which has retrained him once more into a man.

All these benefits will be abrogated if, by the fatuous pushing to an extreme the principle of individual liberty, there is dangled before the eyes of recalcitrants, sophists or weaklings, the opportunity of easily evading the duty of taking advantage of the means to make oneself fit. And yet, the argument is so specious that it has led away a great many into this dangerous counsel. They neglect the fact that we are at war, and while they do not grumble at the far greater hardships involved in the restriction of food and in the liberty of travel, in the shortage of wheat and transportation, yet they swallow this camel and strain at the gnat of personal privilege where the restoration of health to the sick is concerned. Let such objectors look for a moment at the disastrous example furnished by the ineptitude with which psychoneurotic patients have been managed in the British service, where over one hundred thousand men have been discharged unfit from this cause. Let them reflect upon the loss of fighting efficiency of this number. Let them reflect upon the pernicious example furnished by these cases to the rest of the Army, and the softhearted persons who attend to them at home. Let them think of the wastage of personnel and materials used up in their cure, and the enormous expense to which the country is now being put in belated efforts to do now with great difficulty what could have been done with comparative ease in the early stages of these men's trouble, namely, to reeducate them into useful citizens. A further expense to the nation is the enormous pensions which these men are receiving, and which the country can ill afford to pay. This would have been entirely unnecessary had the correct treatment been given them in the first place. It is this eventuality with which we are faced if the stalkinghorse of personal

liberty is permitted to be used to interfere with the essentials which neurologists know are required for the restoration to health of patients of this kind.

The fundamental need in organizing the treatment is the fabrication of a moral atmosphere of the most delicate construction; and ill advised interference on the part of those ignorant of the complexity of the problem inevitably destroys the atmosphere which is the chief requisite for success in the treatment of these unfortunate patients.

Before rushing into public discussion, either in Parliament, in public meetings or in the press, it would be a wise move for those who honestly believe that they have a grievance to bring it before some of the neurologists who have dealt with these patients. The information gained in this way would rectify the misapprehension of many. There will be some, however, who from lack of imagination are incapable of the insight required to understand the question. These people, however, being less clever, are less dangerous. The most dangerous of all are those who are disingenuous, and, at the same time, clever. Their testimony is, however, often discredited in advance when their character is known.

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RHYTHMIC ELECTRIC CURRENTS IN THE TREATMENT OF ABDOMINAL AND PELVIC RELAXATION.

By G. BETTON MASSEY, M. D.,
Philadelphia.

I have sent many messages to those of the medical profession interested in the possibilities of electric power in gynecology, but none of more universal application and usefulness than the few words I shall now have to say of rhythmic currents.

A well known colleague, who had never placed reliance even in the past on a single remedy, though it be the knife, accosted me recently with the question: "I have a lot of women coming here in the afternoon office hours. What kind of electricity can I use for them?" Having a vivid recollection of another surgical gynecologist asking me if putty wouldn't do as well as potter's clay for a dispersing electrode on the abdomen I was puzzled for a moment. The answer then came at once: rhythmic currents. The chances were that nine out of ten of the patients would be benefited by this modality, even administered by the nurse, and that the tenth might possibly be made more comfortable, and surely no worse.

A rhythmic current differs from the older methods of electric neuromuscular stimulation in that waves of stimulation are produced by mechanical means that have a rhythm adapted to the normal muscular impulses of the part treated. Their administration may be continued for a half hour at a time without fatigue (either to the patient or the operator), and present the best solution of the problem of how best to restore muscular tone to

the muscular organs of the pelvis and abdomen. Being rhythmic, and therefore painless, we can use enough current amperage in waves slow enough to stimulate the smooth muscular fibres of the uterus, tubes, and intestinal muscular coats, while at the same time contracting the striated muscles of the pelvis and abdominal wall.

These currents, produced by more or less perfect machines, have been called sinusoidal from the shape of the basal wave of the current, but only what was known as the slow sinusoidal was rhythmic with normal muscle contractions. The curve of the galvanic sinusoidal current is rhythmic, when the waves are slow enough, but unless what has been called the rapid sinusoidal current surges in *cre-scendo* and *diminuendo* waves not faster than fifty a minute, with selection of slower surges down to about twelve a minute, it is not rhythmic. These rapid waves are themselves from forty to seventy-two thousand a minute.

Our handicap in the past, and even now when rhythmic surges are not used, was that a current had to be turned on smoothly, turned off, reversed, and turned on and off again smoothly by hand repeatedly, for half an hour, to be of equal value. This was tiresome, even when a nongalvanic current did not need to be reversed but only surged. The result was that a continuous, unwavering stimulus was applied to a part that normally contracted and relaxed in slow waves.

I leave the practical indications of this remedy to the good sense of both trained and untrained gynecologists. It is self-evident that a wave of power that can reach and contract intestinal muscles, for instance, in a manner tending to restore their normal tone, is better than merely taking tucks in these tubes or structures; and that when a torn muscle has been repaired, as in the perineum, further effort to restore the power of the muscle should be made.

1823 WALLACE STREET.

FIRST AID IN INFANT FEEDING.

BY JACOB SOBEL, M. D.,
New York,

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Infant feeding may be a complex problem, a song of many stanzas, as it has been called, but the refrain—yesterday, today and tomorrow—must always be breast feeding, if we hope to conserve the health, growth, development and life of infants to the greatest degree. In fact, we may say that there are three first aids in infant feeding—1, breast milk, 2, breast milk, and 3, more breast milk, and of the three, the last is by far the most important.

I have no quarrel with the cow. In her place she fulfills an important part in our socioeconomic sphere. However, I do not know but that I may appear somewhat unorthodox in an exposition of this kind, in which the slogan is "milk is Nature's most valuable food," if I preach the gospel of "mother's milk is the infant's most valuable food."

But I would not be true to myself and to the large number of infants whom it has been my privilege to supervise, in private practice and in public health work, for over twenty years, if I did not tell you frankly that I will boost the mother and not the cow. If then, during the course of my remarks, I should emphasize mother's milk for mother's baby rather than cow's milk for mother's baby, you will realize, I hope, that while this attitude may be bad for the milk business, it is best for the infant.

Let me say at the outset that I am entirely in accord with the statement of Dr. McMurchy that a mother should not sublet her duty to a cow. The problem of infant feeding is not merely a temporary one, a problem of preventing the immediate ills of gastrointestinal disturbances, malnutrition or marasmus. It aims further, in that it endeavors to secure the maximum growth, development and resisting power of the infant, with a minimum by-derangement. Feeding in early life determines in a great measure whether the child or man of the future will be a weakling, or strong, robust and vigorous, physically and mentally. With Riha, "I hold a dietetic creed that no amount of proselyting can take away from me, namely, that the majority of gastritides among adults have their origin in the gastroenteric insults of infancy and early childhood."

It is entirely unnecessary to present in detail the reasons for the superiority of breast milk over cow's milk in infant feeding—however pure, safe, clean and properly cared for and prepared the latter may be. It is sufficient to remind you of the lower morbidity and lower mortality among breast fed infants, especially from diseases of the gastrointestinal tract; of the greater and more rapid growth, development, resistance and recuperative powers of breast fed babies, and perhaps, their greater mental development; of the presence in the breast milk, and particularly in the colostrum, of immunizing and protective substances; of the greater assimilability, adjustment and adaptability of breast milk in and to the infant's stomach and digestive powers, and its greater ability to strengthen the stomach; the automatic adaptation of mother's milk and the secretion of the infant's gastrointestinal tract; of the ideal composition of human milk, in that it contains the necessary health and growth giving food constituents in proper proportions and in comparatively uniform amounts; of its proper temperature at all times; of its freedom from harmful bacteria; and its ever readiness under proper healthful and physiological conditions and environment of the mother. Moreover, it is a common observation that even under unfavorable hygienic surroundings, the mortality among breast fed infants in the tenements is comparatively low.

There is, in other words, something about breast milk which enables the baby to put up a better fight against the many dangers with which it is surrounded daily. Truly, breast milk is the infant's elixir of life, and an ounce in the breast is worth two in the bottle. Surely, a food of this kind is one devoutly to be wished for by every infant. Indeed, if the infant could talk, or if, to apply an expression used by one of our famous car-

*Presented at the first session of the New York Child Health Conference, held at the Academy of Medicine, May 19, 1920.

toonists, we were to ask ourselves, "I wonder what a baby is thinking about," we would find it saying or thinking, "I wish my mother would feed me on what Nature intended I should have." But infants cannot talk and therefore it remains for others to file a brief in their behalf and to leave no stone unturned in teaching and urging every mother to breast feed her baby.

An infant that is deprived of mother's milk is essentially and physiologically a premature child. It is said that the baby kangaroo attaches itself to the mother's nipples, clings fast, and only lets go when it is fully matured. Chapin says, "Nowhere in Nature do we see that parents leave their young until the young are able to secure food for themselves; if the necessary food is not all derived from the parent's body, suitable food is provided until the young is able to look out for itself." Most of the newborn of the lower animals are able to look after themselves within a comparatively short time and guard themselves against attack and injury of all kinds. Unlike the lower animals, it was never intended that an infant should shift for itself, but rather, that it should depend for its food, its shelter, its clothing, its comfort and care, for its very existence, upon the aid of its parents, especially the mother, and, in proportion as this aid is good, bad or indifferent, will the future man or woman become a credit or liability to society.

Breast milk is in a sense quite as essential for the nourishment of the child after birth, as the placental circulation is during the prenatal period, and it would be better if we were to consider that an infant should be nourished by the mother approximately eighteen months, nine months through the placental circulation, and nine months by the breast.

Granted, then, that breast feeding is Nature's way, it is plain that we should strive to have one hundred per cent. nursing, if it is possible. In fact, the vast majority of mothers can nurse their babies if they will it or desire it. There are legitimate exceptions, it is true, but they are few and far between. Unfortunately there is a feeling abroad in certain quarters that the capacity for lactation among mothers is less these days than in former years. This is not true in my opinion. The capacity is as great today as ever it was; and if there is a tendency in some places toward diminished maternal nursing, it is due rather to unfortunate economic conditions, which force mothers to engage in gainful occupation; to poor food and housing, which undermine their health; to unwillingness or indifference; in some quarters to pressure of social duties; to the entrance of women into political and social spheres; or, to the only too frequent custom among many physicians and institutions, to tie back the breasts, a few days or weeks after the birth of the child, because the flow of milk has not been as rapid or sufficient as was anticipated, or because of the discouragement of the mother as to the establishment of a promptly functioning breast. The latter in my opinion is a fatal mistake and frequently means the loss of the breast milk to the infant. Even in cases where there has been apparent loss of breast milk, placing the infant to the breast every three or

four hours, combined with diet, exercise, a ready assurance to the mother of success and a healthful frame of mind, it is possible to restore the secretion of an apparently nonfunctionating breast and have it continue for many months. It may be taken as axiomatic, that the further the mother is removed from the home the less the likelihood or possibility of successful breast feeding. Motherhood should not be sacrificed to society. There are few breasts that cannot be made to functionate properly, if the infant is applied frequently enough—not too frequently—every three or four hours, let us say, and if the mother has the necessary hygienic and dietetic care, proper, liberal, wholesome well balanced, palatable, enjoyable and sufficient diet, food to which she is accustomed, good teeth, skin and bowels properly cared for, rest, sleep, exercise, recreation, encouragement and particularly, mental poise.

Aside from those cases of congenital malformation of the breast and nipples or insufficient mammary development which make nursing imperfect or impossible, I might say that from the viewpoint of infant feeding, there are no malfunctionating breasts; they are all good, but some are better than others.

There are some lessons to be learned from the cow. She continues to calf year after year for several years, and to be milked day in and day out for the greater part of each year and continues to give milk of sufficient quantity and good quality, provided, of course, that her food and environment are sufficient and proper. Many mothers, on the other hand, and unfortunately many physicians, consider the mother's milk improper or insufficient after several months, or, indeed after several weeks of nursing. The cow seems to feel that she has been placed here for a purpose, to be milked, and she appears happy and contented with her task. She never seems to tire giving milk. She seems to see her duty and she does it. Can we say the same of all mothers? I recognize the shortcomings of this comparison, but the point which I wish to bring out is the fact that we seem to spend more money and care on the health and efficiency of the cow and her milk than on the care, health and life of the mother. Shall we confess that commercialism is considered of greater moment than humanitarianism? The truth of the matter is that a large part of what applies to the cow applies to the nursing woman. It has been found, time and again, that wet nurses in foundling and infant institutions can nurse one or more infants for a considerable length of time, for one or two years, and give them proper nutriment if their breasts are stimulated by periodical suckling, if they are well emptied, and, if their food and surroundings are in keeping with the maintenance of good health.

While it may not be possible or desirable that an individual mother should continue lactation longer than nine to ten months, or perhaps, during the first year of the child's life, it is a fact that the great majority of mothers can nurse their infants if they so desire, or, if the physician persists and insists in surrounding them with all the essential factors for establishing and maintaining a proper supply. In fact, such noted clinicians as Finkelstein,

Schlossman and Engel, have said "there is practically no limit to the period of lactation of a good wet nurse, and that the breast will continue to secrete a good quantity of milk so long as the stimulus of suckling is supplied." That these are true statements I have reason to believe from the many years of observation and from my own personal experiences in which I was able to reestablish a satisfactory supply of milk in the breasts of women who for one reason or another had discontinued such feeding at the time the infants came under my personal care. Most breasts can be educated into giving a liberal supply of good milk, by persistence on the part of the physician and the mother.

If but a small fraction of the time, energy, and thought that have been given by physicians to the elaboration of the different methods of artificial feeding, to say nothing of the vast amount of money spent by commercial concerns in propaganda directed to convincing physicians and the public at large that their proprietary *foods* are God given substitutes for milk, were devoted to the study and encouragement of breast feeding, the bottle fed baby would be the great exception. There is no perfect substitute for mother's milk. Science at best can only approximate it.

Truby King says, "The mere changing of the percentage of the food elements in cow's milk, to correspond with those in breast milk, does not by any means change cow's milk into mother's milk. The differences are far more subtle than mere percentages." No mother should be permitted to feed her baby artificially unless some direct and definite contraindication to breast feeding exists—tuberculosis, epilepsy, insanity, chronic wasting disease, extensive infection of the breasts—or, until the physician is convinced beyond any doubt that all known accessory measures have failed to arouse the breast to activity. Even if there is only sufficient breast milk at hand for one or more feedings these should be given and supplemented by cow's milk for "every drop of mother's milk is precious to the baby, especially during the first months of life."

The activity of the breasts depends largely upon the stimulation which they receive, and the best stimulus is the suckling of a vigorous infant. Here too, we can learn much from the cow. The farmers soon found that unless the udder was emptied at each milking and unless the milkings took place at sufficiently frequent intervals, the cows did not give a full amount and in time ceased to give milk at all. The failure of milking machines was due to the fact that they did not empty the udders and the cows gave less milk than in hand milking. So it is in the human breasts. Unless the child is placed at the breast at frequent intervals and the breasts are emptied, they soon functionate imperfectly or cease to functionate altogether. For an efficient emptying of the breasts it is necessary that the infant be hungry and too frequent feeding, that is, every two or two and a half hours, makes the infant less hungry, less desirous of suckling and therefore less likely to empty the breasts. Besides, the end milk of the breasts, as well as of the udder, contains the bulk of fat and therefore if the breast is not emptied the child does not get sufficient nourish-

ment. Too frequent feeding and improper suckling, therefore, have a deleterious effect upon the nourishment of the infant as well as upon the milk supply of the breasts. While mechanical or artificial emptying of the breasts—sometimes necessary in the case of frail and delicate infants and in acute illness of the mother, by the use of breast pumps, affords a certain amount of stimulation, like the milking machine, it is at best, a poor substitute for the natural method of suckling by the infant.

One word of caution in regard to breast feeding. Despite its great value and its advantages over artificial feeding, there is sometimes a tendency on the part of mothers and physicians who desire to persevere in this method of feeding to continue its administration too long even though the infant is not thriving; that is to say, either remaining stationary in weight, losing in weight or otherwise suffering from indigestion. Breast feeding must be conducted in a practical and commonsense way. Therefore, it has been well said by Reuben, "good breast milk is better than good artificial feeding but good artificial feeding is better than poor breast milk." On the other hand there are mothers who are reluctant, because of fancied or imaginary reasons, to suckle their young and who have been led to believe by friends and neighbors and often by some physicians to regard feeding with cow's milk as just as good as breast milk. The best answer to give these mothers is to tell them the story quoted by Jacobi: Old Dr. Heim was told by a so-called noble mother: "I keep an ass for my baby. Ass's milk is as good for my baby as my own milk would be, is it not?" "Yes, yes," said the old man, "just as good for young asses."

Dr. Chapin has started the call "back to the home" for the supervision of children deprived of a mother's care. It is high time that we take up a similar call with reference to the feeding of infants and proclaim "back to the breast."

But, after all, I must confess that an unnecessarily large number of infants are deprived of what is theirs by right, mother's milk, never through any fault of their own, frequently through no fault of the mother but often because of the failure of municipalities to surround the expectant mother with those safeguards which make for the protection of her life and the maintenance of her health. Too frequently we forget that "the baby's life and pathology begin nine months before its birth." There is something so interesting, so human, so tangible, so dramatic about the newborn baby, that we fail to realize that the condition of the baby at birth and for the greater part of the first year, depends largely upon the care of the mother before its birth. The question of breast feeding therefore arises or should arise, long before the birth of the baby. Since it is admitted that breast feeding is the method of feeding par excellence, and since the ability to nourish the infant depends upon the health and vitality of the mother, it follows that all efforts should be directed toward preparing the breasts to functionate properly at the time of the birth of the baby. To me, therefore, the very first aid in infant feeding consists in a proper supervision of the expectant mother.

Aside from the many advantages which accrue to mothers and infants, as the result of proper prenatal care, let us concentrate upon the relation of this care to the infant's procurement of what is its birthright—mother's milk. It is safe to say that the better the prenatal care received by the mother, the greater the likelihood of her desire and ability to nurse the baby. It is a sad commentary upon the progressiveness of our country to find that the United States is fourteenth in the list of countries of the world as regards maternal mortality rates relative to pregnancy and seventh in the list as regards the infant mortality rate. In other words, in thirteen other countries the life of the mother during pregnancy is safer than in our own country.

I wonder whether many people stop to consider the relation between prenatal care and breast feeding? Whether they stop to consider that the first aid is placing the mother in such a condition during pregnancy that she will not only desire to nurse her baby but that she will be alive and healthy enough to do so. But even that is not enough. We must also surround her with all necessary precautions which will enable her to bring into the world a vigorous and healthy baby, one who will suckle well and by such stimulation maintain a proper and sufficient flow of breast milk. Why then, is prenatal care so important in relation to breast feeding? The answer is to be found in the maternal and infant mortality and morbidity statistics incident to pregnancy. Here is the indictment with its many counts—and to which future civilization must answer "guilty" or "not guilty."

1. The Federal Children's Bureau makes the statement that more women of the child bearing age, fifteen to forty-five years, die from conditions incident to pregnancy than from any other single cause except tuberculosis. Dr. Henry C. Davis says, that "the records of life insurance companies show that for all women who are insured under forty-five years of age the diseases of pregnancy and the puerperal state are the second greatest causes of death." The Metropolitan Life Insurance Company makes the statement, "that it is a national blemish that the death hazard involved in bearing children, is greater than that in mining coal or in railway services." Death robs the infant of mother's milk—of mother's care. While in recent years, the deaths from many communicable and other diseases have been reduced materially, the mortality incident to childbirth has shown comparatively little appreciable reduction.

2. A large number of maternal accidents and injuries incident to childbirth and of other conditions occurring during pregnancy undermine the health and vitality of mothers, result in infections of the breasts and nipples and other conditions which make the mother a chronic invalid and prevent her from nursing the baby, however anxious and willing she may be to do so. The saddest feature of all this is that very many of these conditions are preventable. As Dr. George Newman puts it, "A vast number of women are made invalids for life or lose a large part of their economic value or become sterile or die ultimately from injuries received or disease acquired while fulfilling or

attempting to fulfil the functions of motherhood."

3. Over forty per cent. of all deaths during the first year of life are due to congenital diseases which are dependent in a large measure upon improper care received by the mother during pregnancy; and here too, a large proportion of these deaths are preventable. In fact, during the years 1918 and 1919, the infant mortality statistics for the city of New York showed that more deaths were ascribed to congenital diseases alone than to diarrheal and respiratory diseases combined.

4. About forty-two per cent. of the deaths of infants under one year of age take place during the first month of life and the majority of these deaths are due to congenital diseases, prematurity, debility, marasmus, convulsions, accidents, injuries, etc.—conditions which often call for mother's milk as a life saving measure. With a mother dead or invalidated because of improper, insufficient, or no prenatal care, what chance has the majority of these infants?

5. While statistics show that the infant mortality rate as a whole and the rate from the second to the twelfth month of life have shown a steady decline in recent years the infant mortality rate under one month of age has remained practically stationary. Since the vast majority of deaths during the first month of life are due to congenital causes, largely dependent upon the health and environment of the mother during pregnancy, and to conditions in which breast milk would prove a life saving measure, the importance of prenatal supervision is selfevident.

Wherever and whenever intensive prenatal work has been conducted by municipalities, by private organizations or by large insurance companies, the maternal and infant mortality and morbidity among these selected groups of expectant mothers and their infants have been considerably lower than among similar unsupervised groups of the community. In witness whereof we point to the results of the Bureau of Child Hygiene of New York city, the maternity centre associations, the Metropolitan Life Insurance Company, and to similar results in Boston, Pittsburgh, Cleveland and other cities.

There are many other statistics recorded in previous publications which I could quote in justification of the urgent need of systematic prenatal care, but I have purposely limited myself to those which bear directly upon the question of breast feeding. In the face of such a presentation can there be any doubt of the verdict of the jury—the public—as to the immediate and direct need of placing at the disposal of every expectant mother all necessary information and material assistance for her own safety and that of the newborn infant. Society owes a debt to the expectant mother which it must discharge. It is not enough to await the arrival of the baby and then proceed to look after the breasts. The way must be paved by prenatal care. Instruction and supervision of expectant mothers will, as numerous studies and experiments have demonstrated, give in most cases a healthy mother and a healthy infant; and if as a result of the intricacies of Nature and despite all prenatal care, there

is born into the world a puny, delicate infant, the existence of a healthy mother with an abundance of good breast milk is the best health and life insurance policy that the baby could have. With all these facts before us, with a knowledge that breast feeding is God's way, that prenatal care is the most pressing, urgent and direct need of the present for the protection and conservation of mothers and babies, with the indifference shown on the part of most cities in the organization of a corps of prenatal nurses, it is not too much to predict, that soon the citizenry of our country will cry aloud, "How long, oh municipalities, will you abuse our patience?"

In spite of all the known and frequently repeated argumentative data in favor of prenatal care, a thoroughly organized municipal service for such care exists in comparatively few cities. It seems as if private and semiprivate philanthropic and social organizations have seen the light of this great need to a degree far in excess of that evinced by municipal authorities, by the organization of maternity centres which seek to coordinate in localized sections all existing facilities for the examination, home or institutional supervision, care and treatment of expectant mothers. Why this is so is difficult to understand, unless it is that the results and possibilities of prenatal care are not so immediately or directly demonstrable as those of infant mortality control and for this reason those in charge of city funds hesitate to make the necessary appropriation.

Prenatal care has a double purpose to perform—the giving of a healthy mother to the newborn infant, and the giving of a strong and vigorous infant to the mother. Without a healthy mother there is a possibility and likelihood of insufficient breast milk in quality and quantity; without a healthy infant there is a likelihood of inability to suckle well and the danger of improperly functioning breasts. The interdependence of mother and child in relation to breast feeding becomes apparent.

Happily, there is an awakening, slow though it is, as to the dire need of prenatal care. There is no earthly reason why more women of child bearing age should die from causes incident to pregnancy than from any other cause except tuberculosis, no other reason than an indifference or neglect on the part of municipalities. Maternal and infant morbidity and mortality dependent upon pregnancy, labor and puerperium are amenable to a decided reduction through a properly organized prenatal program, and not the least advantage of such procedure will be the saving of the lives and health of a larger number of mothers.

That the supervision of expectant mothers has a distinct bearing upon the possibility of increasing the number of babies who are breast fed has been shown in several studies conducted by the Bureau of Child Hygiene, Department of Health, City of New York, in which as a result of surveys made it has been found that while approximately eighty per cent. of mothers among the tenement population nurse their babies exclusively and while approximately sixty-eight per cent. of the babies enrolled at the baby health stations are breast fed exclusively and some thirteen per cent. partially, the number of infants who are entirely breast fed during the first

month of life, while under the care of a special corps of prenatal nurses, maintained by the Bureau of Child Hygiene, is approximately ninety-three per cent.

I desire to emphasize the importance of prenatal care, because in my opinion it forms the basis of every program for securing a larger number of nursing mothers. Every child has a right to be well born. A child's greatest asset is a healthy father and a healthy mother. Prenatal supervision carried out during many months of pregnancy, prepares the way for the good health of the mother, a healthy mental attitude towards nursing, good breasts and nipples, in other words, a comfortable pregnancy, a safe labor, and an uneventful puerperium. Sir Arthur Newsholme has said, "the mother is the main element in the environment of the infant." Since many of the conditions which surround the expectant mother and which maim or kill her are preventable, it behooves us for the sake of the infant, if not for the mother's sake, so to safeguard her health and wellbeing that she will be in a position to nurse her infant.

This is how the venerable Jacobi sums up the question. "What I want is that a pregnant woman should be in a condition to carry her fetus to its legitimate end in health and vigor and be able to nurse her infant. Every textbook talks to us of the inability of the woman to do so and indicates formulæ and trade shops and factories from which to graduate toothless young Americans. One hundred per cent. of our women, however, can be made to nurse, even the flower and fashion of the land. By breast feeding you will save a hundred thousand babies that now die or become invalids, from no other cause than unnatural feeding."

The care of the expectant mother has passed beyond the borders of municipalities or states. It has assumed national importance and has engaged the attention of the Government, to the end that ways and means are now being formulated to give federal aid to various states for the public protection of maternity and infancy and to establish minimum standards for such protection. An infant is always fighting with its back to the wall; but it is a brave little fighter holding on tenaciously until the reserves of care, attention and diet are brought to its aid. Yes, the most dangerous occupation in the world is that of being a baby. Less chance to live a week than a man of ninety, and to live a year than a man of eighty; less likely to survive its first year than an aviator who makes ascensions daily has of being alive at the end of the first year. Six times more dangerous than life in the trenches, do you wonder that it is necessary to surround it with safeguards against the many pitfalls which endanger it daily? And of these safeguards, the two most important are: 1, proper instruction and supervision of the mother who bore it; 2, every effort to provide it with what God and Nature intended it should have—breast milk. To nurse a baby is a mother's privilege and duty, to be nursed by its mother is a baby's birthright. Let there be no slackers in the great campaign of first aid in infant feeding, in the great cause for more and better babies—the instruction and supervision of expectant mothers.

DISTURBANCES OF THE HEART AND LIVER CAUSED BY LOW GRADES OF ASTIGMATISM.*

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From the army which was recently drafted in the United States, a number of men who had been declared perfect on examination had to be dropped because of the fact that when they were put to the actual task of drilling and other physical exercises their hearts failed, and they became winded and exhausted, and yet showed nothing demonstrable on physical examination to explain why they were not as good as the others who stood up under similar conditions. In an article by George E. Pfahler (1), this class is characterized as the constitutionally inferior or third raters. While explaining nothing, cardiologists have termed this condition neurocirculatory asthenia, and as far as I am able to gather from my reading, they have nothing of value to offer for its relief.

For more than a decade I have observed cases of this type in civil life, whose number would run into hundreds, if limited to circulatory symptoms, and into thousands if many of the associated symptoms were the objects of consideration, which were largely or totally relieved by a thorough correction of errors of refraction. The title of this paper is intended to emphasize that any or all astigmatism must be corrected to the finest degree possible as to strength and axis of cylinder, else the small error remaining for the eye to overcome will still permit the continuance of symptoms. This does not mean that the other source of refractive eyestrain, hyperopia, does not play its part and need correction, which should be done; neither does it mean that myopia, which is not a source of refractive eyestrain, is not to be reckoned with. But associated with myopia and hyperopia of all degrees, and in cases of supposedly noncorrectible irregular refraction, there is usually more or less astigmatism, at times very difficult to establish as to exact amount and axis, unless the examiner is dominated by a fixed conviction that the symptoms point to astigmatism, and he will not stop until it has been worked out correctly.

I have found it best to presume that astigmatism is always present until its absence is indisputably proved, and in few cases presenting sufficient symptoms to call for examination can its absence be proved. It is said that in the early days of modern refraction, when visual acuteness was the only desideratum, that astigmatism under 1 D. did not amount to much; and without wishing to disturb the shade of the great Donders, it is stated he considered half a dioptre as the minimum of value. This is still largely true in non-presbyopes, from the viewpoint of attaining the sharpest vision possible; but where that search ends, the search for so-called eyestrain properly begins.

It would be desirable if a better term could be substituted for eyestrain, say eyestress, as the former term to the laity conveys the meaning of conscious effort on the part of the eyes, whereas it is most

often totally unconscious. Another error to be combated in the minds of the laity and general medical profession is that all cases of eyestress must produce either pain, discomfort or weakness of eyes, or some of the old classical symptoms of headache, nausea or nervousness. I wish to state with all emphasis possible that more people in my belief suffer from the eyes, than with the eyes, and my hope that the day will come when every patient affected with a persistent vertigo, pain or drawing in the neck or shoulders, unexplainable general fatigue, nervous depression, gas in stomach, cardiac asthenia, or cold, clammy feet, will be referred to the most painstaking oculist available, for that careful search for astigmatism, either alone or buried under a smaller or larger amount of far or near sightedness, the correction of which usually brings relief after enough time elapses to permit the dying out of these vicious symptoms after removal of their cause. Not to inform patients of this necessary lapse of time is likely to cause them to discard our efforts as futile, bringing loss to themselves and disrepute to their oculist.

During the earlier years of my career, following the lead of such authors as I had been able to study, I held the belief that astigmatism not reducing vision in presbyopes, especially advanced presbyopes, was of little or no consequence, and that presbyopia when fairly complete had so set the accommodative mechanism that eyestress could not result. To me the doctrine is now anathema maranatha; one that should be utterly stamped out, regardless of any theoretical bolstering up, when cold facts prove how much somatic disturbance may come from astigmatism, especially of low degree, at advanced ages.

As some of the tenets set forth in this article, together with their attempted explanation, will no doubt challenge the credulity of some and the antagonism of others, it is desirable to go into certain details that would otherwise seem unwarrantable. Lieut. Col. R. H. Elliott, in a paper on errors of refraction says (2): "Let each one tell what they actually do in their practice and not what they would like to do, or what they would like others to think they do"; and further on quotes Kipling's lines:

"But each for the joy of the working,
And each on his separate star,
Shall draw the Thing as he sees It,
For the God of Things as They are."

In the first place, the fitting of glasses, aside from simple presbyopia, should be considered as much a part of the practice of medicine, as diagnosing diseases, prescribing drugs, or doing minor surgery. In many patients the issues of being able to enjoy good health and successfully pursue happiness, are as much dependent on a proper refraction as the outcome of some of the most ambitious operations of major surgery, where the issue of life itself is not involved. But in the estimation of the laity, and sometimes of the medical profession, getting glasses is merely a matter of purchase with the purchaser as the chief arbiter of what is to be done.

In late years much stress has been laid on disturbances of the ductless glands, in the practical investigation and application of which Dr. Crile has

*Read before the American Academy of Ophthalmology and Otolaryngology, Cleveland, October 16, 1919.

played a prominent part. In his masterful contribution on the kinetic drive he has shown the effect of infections, of loss of sleep, and great fear or long continued anxiety or depressing emotions, and as the ductless glands and sympathetic nervous system are the drivers of the heart, whatever stimulates or inhibits these must bear out its effects on the heart. To his list of disturbers should be added another, as potent as any, and probably more common than all of the others, viz., eyestrain. Since the promulgation of our present day beliefs as to hyperthyroidism and hypothyroidism, the similarity of these in many respects to long continued eyestrain has forcibly struck me, and caused a belief that the thyroid was being held responsible for a number of sins chargeable to the prime cause of eyes under stress, although they work their harm by causing secondary derangement of the ductless glands, chiefly the thyroid, and probably the adrenals and pituitary. These cases early in their evolution probably first pass through a short phase of hyperthyroid symptoms, as in the case of a girl of twelve who came in while this paper was being written. She came on account of mild discomfort in her eyes with nervous excitability. Her pulse on admission, after a short conversation on commonplace things, was 136; after sitting an hour waiting on cycloplegic drops, it was 120, and pounding like a triphammer. Her mother had noticed this in her sleep. The more common cases have passed from hyperthyroid to hypothyroid symptoms of nervous depression. In a recent case in a young married woman apparently in the best of health the pulse was 64. She had been sent by her physician to seek relief for headaches, and inquiry showed that she also had dizziness, pain in the neck and shoulder, was nervous, depressed, tired, easily winded, and had a palpitating heart, the first sounds of which were rather faint, but no discomfort or weakness about the eyes. She had undergone a thyroidectomy seventeen months previously. When she came back five weeks after having her astigmatism corrected, she was already beginning to feel better, her pulse was 76, and the heart sounds were distinct.

A misconception universal among the laity, and general among physicians, is that eyestrain only comes from the near use of the eyes, and is dependent on long hours of close work, and should therefore find its chief sufferers among bookkeepers, students, stenographers, and seamstresses, and should be relieved by giving up these various callings for a life in the open. A more pernicious and misleading doctrine was never promulgated. The majority of the patients observed were the wives or daughters of farmers, miners, carpenters, railroaders, and mill workers, who gave relatively more time to domestic duties and less to reading or needle work than did those who call themselves the intellectuals.

Women are more frequently subject to symptoms of eyestrain than men, notably in regard to nervousness, the neck and shoulder pain or drawing, and cold feet. The man more often controls his nerves. But when a man does have the neck and shoulder pain, which is a liver symptom, or cold feet, a heart symptom, he usually has them badly. It is a com-

mon occurrence to have a well developed husky farmer or mechanic come for some minor discomfort of the eyes, and reveal, upon inquiry, that he is easily tired and winded by a short amount of physical effort, and has been puzzled as to why it should be; or has been taking general or heart tonics without avail. These are often presbyopes with reading glasses or bifocals giving perfect vision, but poor satisfaction. A recent illustrative case occurred in a man of forty-eight, healthy and robust in looks, leading an active outdoor life, who complained for many years that his eyes burned, itched, reddened, and pained from bright light, that things would blur after a short time, and the eyes would water too readily. He had frequent headaches, occasional sick headaches, was very dizzy, had severe neck and shoulder pain, was easily tired and winded, with palpitation of heart, and his feet and legs were cold. He stated that he frequently bandaged his knees to keep them warm. The glasses he had been wearing were lost when an attack of dizziness struck him while he was driving, and the car with himself and wife rolled down a bank. This patient had a common condition that may never appreciably blur vision, but is prolific of eyestrain—mixed astigmatism of low degree. Roby and Boas (3) gave the results of studying a series of cases of neurocirculatory asthenia at Camp McClellan, in which they concluded that exercises accomplish little or nothing toward overcoming the weakness, but are of great value in establishing the diagnosis. They refer to accompanying dizziness, and emotional stress. In discussing this paper, Sir James Mackenzie, of London, spoke of some of these patients having cold extremities, at times being flushed. It is common to have some patients with eye symptoms complain of hot burning feet, when under similar conditions others complain of cold.

Friedlander and Freyhof (4) and Barringer (5) emphasize the associated symptoms of dizziness, nervousness and cold, clammy extremities, and the fact that many of the patients were below par since childhood. Other observers (6) started out with a belief that statistics would show the condition more often associated with enlarged thyroid, but the result, as far as any differences went, was in favor of a greater prevalence where there was no thyroid enlargement. To show that their clinical description conforms to the types of cases which have been relieved by correcting astigmatism carefully, several quotations will be made. "The symptoms were precordial pain with dyspnea and palpitation on moderate exertion, such indications of vasomotor instability as dizziness, flushing and fainting, and a variety of other complaints, all pointing to a state of excessive reaction of the nervous system to psychic or physical strain.

"Dyspnea, palpitation, and precordial pain are taken as cardiac symptoms. Dizziness, flushing and fainting are taken as indications of vasomotor instability. Mental irritability, emotionalism, apprehensions, depression, excitability and exhaustion, and shakiness after exertion or excitement, were all grouped under the heading of nervous instability."

One of the outstanding clinical features in both

conditions, though this is more especially true in neurocirculatory asthenia, is the multiplicity of subjective complaints, and the paucity or absence of objective evidence. So it is mainly on symptoms and not on signs, that the diagnosis rests. And the special characteristic of the symptoms is the wide field they cover. It is not only the cardiac or the vasomotor or the nervous system which is at fault, but all three together. "What has been termed the symptom complex, that is, an association in the same individual of symptoms of cardiac, vasomotor and nervous instability, is as often seen in nonthyroid as in thyroid cases."

These cases are not rare in civil life, but when looked for, will be found rather commonly. When it is considered to what extent the patients may be relieved by a correction of all the errors of refraction, and proper glasses worn all the time for a long enough period, it makes the remark of one of America's foremost surgical ophthalmotorhinologists publicly expressed some years ago that the refractionists claim to cure everything from headaches to hemorrhoids with glasses, seem as full of truth as of sarcasm, for it can safely be said that by this means many ills from vertigo to cold feet are permanently eradicated.

In addition to the hyperthyroid and emotional stress hypotheses, Major Carroll (7) seeks to establish, as have also some of the other authors quoted, chronic infections as a cause of neurocirculatory asthenia. There is no doubt that all of these play a contributing part in a lowered resistance caused by some previously acting cause. Few things of slow development come from a single condition, but a combination of conditions and circumstances, and sudden collapse of a heart or a mind is more often due to long and slowly acting, unrecognized undermining, than the immediate precipitating cause. If the matter could be tested out, it would probably be found that a large proportion of shell shock cases, as well as the neurocirculatory cases, had been undermined by a long acting eye strain. As corroborative of my assertion that eye strain symptoms affecting the heart are not more common among close workers with the eyes, the following quotations from F. G. Hein (8) are based on studies of neurocirculatory asthenia at Camp Sherman: "Three hundred men returned to the development battalion from the various line organizations because of complaint of heart trouble throw some light on this problem. The men passed apparently normal, were placed in organizations, found unable to drill, rejected as unfit for military service, and referred to the development battalion. It is interesting to note that 154 have had symptoms for five years or more, some insisting that they have always had distress. As shown in Chart I, the largest number of cases occurred among farmers, with laborers next, the two classes forming fifty-six per cent. of the total. The clerical positions came next, with seventeen per cent. Giddiness, present in 242 cases, was the most common symptom; on prolonged or sudden severe effort, dyspnea occurred in 239 instances. A hike, or double quick time, sent these men out of formation in short order."

An impressive illustration of the effect of correcting astigmatism in these heart cases, and the permanency of the relief, occurred some years ago in Mr. H., a man of athletic build and exemplary habits. He was raised on a farm and worked at milling when the farm work did not demand his attention. After manhood he qualified for, and entered the legal profession. After getting into his early forties his heart began to functionate poorly, and anemia and morbid fears developed to the extent that for several years he never began a day with any feeling of assurance he would live through it; did not dare to lock a door for fear he would drop dead and some one would have to break in the door; dreaded to undertake the simplest duties of his profession, for fear he might not live to finish them; if he started across the street to the barber shop, he wondered if he would live to get there, and seated in the chair he would think "this barber will look up, and when he looks down again, he will be looking at a dead man." His home physician could make out no organic heart trouble, and finally referred him to Dr. Thayer, in Baltimore, who also pronounced him free of any organic heart trouble on three separate occasions, and advised him to return for a season to the simple rural life, living in the open, attending as hostler to his pony and other tasks. He also went to Florida for a few months as a relaxation and diversion. His eyes had never given him the slightest trouble in feeling or function until at the age of forty-five he began to have considerable trouble skirmishing for lights and focus; in other words, he had normal presbyopia.

On May 13, 1910, at the age of forty-six, he applied to me for optical aid. There were no symptoms of eye discomforts or headaches, he simply had to hold the print off, and then could not see the two smaller blocks of Jaeger types. An examination showed a considerable amount of mixed astigmatism; the cycloplegic drops were used, and as is generally the case, eliminated a considerable part of the minus element. I had for some years been convinced of the disturbing action of astigmatism on the heart, especially as exemplified in chronic cold feet in women of a most robust type, as well as delicate looking persons. I told him: "Mr. H., I think we have the nigger in the woodpile that has been causing all your heart trouble." Such proved to be the case, for with the constant wearing of glasses, to which presbyopic addition was subsequently made, he soon threw off his disabilities, and he has remained well to the present time. Last year he applied for life insurance, and the company held up his application because of a loss of weight of twenty pounds from his erstwhile average, and asked for an explanation. His answer was that the country was at war and long on lawyers and short on farmers, so he went back to the farm and worked off that twenty pounds. They gave him the insurance. The anemia referred to has often been noted, and it is no rare thing to see it vanish as rapidly after eye correction, as it does in other cases when the cause, such as malaria, sepsis, or hookworm is removed. Likewise, patients under their normal health weight, often gain flesh with the same rapidity. Where the anemia and loss of

weight have been marked, it is sometimes hard to recognize the patient as the same person after a few months. This is because the nutritional system is upset by the disturbances of the liver.

Dr. Lyster says (9): "After studying the subject in the military camp at Camp Custer, Mich., I am convinced that this syndrome, which was first described by Da Costa, during the Civil War, and by the French, English and American physicians during the recent war, is not a cardiovascular disturbance primarily, but the disturbance of the autonomic and sympathetic nervous systems." Dr. Bliss says, "An internist in France insisted that all these cases were caused by a hyperthyroid condition, while I insisted that relatively few were due to a hyperthyroid condition. There are constitutional cases. You cannot make soldiers out of these men. No form of treatment changed these individuals, either physically or mentally, so as to enable them to be good soldiers. The important point to recognize is that they were constitutionally inferior, and not capable of such restoration as would make them efficient men." Dr. Neilson says, "When the first soldiers were being examined in St. Louis, I went so far as to accuse some one of giving these young men thyroid extract. We put many of them into the army. Some came back with neuritis, some with hyperthyroidism, and some with constitutional disorders. Later I decided to put these individuals into limited service, but I found that the limited service men worked just as hard as the regular soldiers, so we decided to send them back to their own work. We do not know what is wrong with these people, or that there is anything wrong with them, but I believe there is something behind it. I am not so enthusiastic as to attribute all these disturbances to the ductless glands."

Time and again I have observed patients of this type who applied either for minor discomforts about their eyes, or in their opinion, things which might be due to eyes, when inquiry revealed that they were either tired, or became easily exhausted, and became dyspneic from the slightest exertion, when their appearance indicated they should measure up to full standards of strength. Not a few have come for aural troubles, and in a purely accidental way, have spoken of how tired they always were, and how quickly they became exhausted, and had no complaint whatever as to comfort or endurance of vision, and yet a painstaking correction of refractive errors, often exceedingly small and hard to find, would relieve them of the asthenia. In many of these cases vision was absolutely normal, and the eyes rejected all glasses indicative of ametropia; but the use of a cycloplegic would often reveal a surprising amount of concealed error, even up to the age of fifty or beyond. On the other hand, the error may be so slight that vision under a cycloplegic is normal, and apparently no error to tests made with no more than ordinary care, but by taking sufficient pains, a low cylinder can be definitely proved to be called for and in this class of cases some of the most phenomenal results have been achieved.

A few years ago a civil engineer, aged thirty, complained of great fatigue in the presence of a

railroad official, who had, by accident, fallen under eye treatment which relieved him of these mysterious fatigue symptoms, and was told to have his eyes investigated. He had in addition to a general fatigue beyond reason, several other symptoms of eye strain, and as usual no importance was attached to the fact that the vision was supernormal and tests for error repudiated, but when under a cycloplegic vision was 20/16, and all glasses for a time rejected, things began to get interesting. By much persistence, the presence in one eye of one quarter of a diopter of astigmatism with axis at off angle, and the other a like astigmatism with equal spherical error, was finally established. It was explained to him he must wear glasses all the time. Some months later, he was observed to be much improved in appearance and weight.

Detractors of the value of exact correction of errors say that much of the good observed is due to suggestion on the part of an enthusiastic refractionist, and expectancy on the part of the patient. This criticism is readily answered by the havoc played with many patients who have been relieved, when one cylinder gets thrown a few degrees off axis, and the patient still thinks his glasses the same. Such patients will sometimes say, "I cannot wear my glasses, and I cannot go without them." In older days with flat lenses, this often came about by a glass falling out and being put in backward, or having the frame bent; in latter days, by accidental rotation of a round lens. Another source of trouble is replacing lenses from the broken pieces, when either the axis of a recognized cylinder is slightly misplaced, or a weak cylinder, in combination with a strong spherical, is altogether overlooked. An illustrative case is a man of forty, of athletic proportions, who came six years ago for sundry vague complaints about his eyes of several years' duration. Inquiry revealed that he was always tired, got no relief from vacations, and had to force an interest in his business. Eyes tested normal, but under a cycloplegic, right showed one and a half spherical with one quarter cylinder axis 135, and left one spherical with +0.62 cylinder axis forty-five, which were given for constant wear. After the usual difficulty of getting used to them for distance, he was relieved in body and mind, and got on well for two years. His old symptoms then returned, and he came for reexamination. It was observed he had other glasses, which he said were made on the formula of those first worn. Inspection showed the cylinders had been omitted, and when glasses were supplied by correct formula, he became well again. At the expiration of another year, he indulged in the new-style round lenses, and symptoms again drove him to report for relief, when lenses were found correct, but axis of cylinders reversed. They were set right and marked, and no trouble has been reported since. The majority of these patients with muscular asthenia, neurasthenia, and psychasthenia, if questioned, will also be found to present evidences of neurocirculatory asthenia, as exemplified by their being easily winded, with palpitation of the heart from slight effort, clammy hands and feet, and the other symptoms detailed in the previous quotations.

These conditions are much more common among women than among men, and in a regiment of Amazons a large proportion would drop out when put to drilling. To see these Amazon women who are always dead tired, with pain or drawing in the neck and shoulders, easily winded, with fluttering hearts, gas in stomachs, and cold, clammy extremities, measure up to their looks after having an astigmatism corrected, is more suggestive of a play that is staged, than the realities of life. They will often say on presentation, that the worst of it is, they look so healthy and strong, that no one will believe how tired they are, and how miserable they feel. On the other hand, some of the opposite type look as miserable as they feel, and in such the improvement in looks, color and weight may be observed *pari passu*, with their feelings. One not infrequent afterresult is that those who had settled down into a condition of confirmed celibacy feel so buoyed up in health and spirits, that they view life from a different angle, and embark on the sea of matrimony. Nearly two decades ago I began to note, more frequently in women, in cases of eyestrain, the presence of a pain or pulling in the neck, or shoulders, or between the shoulders, not rarely running out into the arm, or even to the finger tips, accompanied by a tingling or numbness in the arm which has been pronounced by some as neuritis. This pain also in some instances runs from neck to ear, or continues on from ear to eye. However old, or well known this symptom may be to others it is only in very recent years I can recall having seen any reference to it in such promiscuous articles as I am able to peruse, as for instance in the report of Major Newcomb (10), of the Army Service, where it is referred to as the checkrein symptom.

It is not mentioned by Stephenson (10), who covered the literature of the subject up to date of its publication four or five years ago. In seeking its explanation, I came to the conclusion it was a distress signal of the liver; the older works on medicine abounded in references to pain in the shoulder as a symptom of liver disease. Anatomists tell us the parenchyma of the liver has no sensory nerves, but only sympathetic fibres, but that these sympathetic fibres anastomose with the spinal sensory nerves, and it is most likely by this means the protest of the liver is registered against a factor disturbing its normal functioning. By this same inhibition of hepatic functioning is also plausibly explained the flatulence so commonly due to eyestrain in elderly people of both sexes, but probably more common in females. In presbyopes, who have obtained age glasses and found them unsatisfactory, it is one of the very commonest of symptoms, and usually diminishes or goes away when the causative astigmatism is properly corrected by glasses worn absolutely all the time except when patients go to bed to sleep. It is likewise my belief that the headaches and sick headaches recognized for two generations as coming from the eyes, and the vertigo equally common, but not so generally admitted as an eyestrain reflex, are directly due to the inhibition of hepatic function by eyestrain, and are consequently exactly the same in nature as the

acute bilious attacks due to other transient causes, putting the liver out of commission for the time being, such as getting overheated on a full stomach. Inasmuch as Dame Nature finds relief from emptying the stomach under these conditions by vomiting, she tries the same tactics in the headaches due to eyestrain, thus explaining the nausea or vomiting of sick headaches.

On February 15, 1910, a woman aged thirty-nine, came to me because of sundry discomforts in the use of her eyes, and inquiry revealed she had for several years suffered from a severe pain under her right shoulder blade, which remained, much to the perplexity of her surgeon, after he had removed a large number of gallstones by operation, other symptoms due to gallstones having vanished. I remarked that I had for some years been interested in the similarity of certain symptoms arising from gallstones and eyestrain and hers would be a good case to try them out separately. She showed some manifest error but much more under a cycloplegic, and surprised and pleased her oculist by wearing the full correction without the usual protests about the annoyances of breaking the eyes to the glasses. When commended for this, she said the glasses were doing too much good to complain about. That before, life did not seem worth living; the pain was gone, and even her children noticed a change.

In discussing the origin of vertigo, the older medical works had much to say of plethora, and disorders of the stomach and liver, while the latter day works speak of high blood pressure, arteriosclerosis, and aural troubles. It seems to me that in late years the current literature on vertigo from aural origin to that from ocular origin is about in the proportion of an unabridged dictionary to a pocket edition, while from my observations the reverse is really the case. Patients with hardening of the arteries and vertigo to the point of complete incapacity for the ordinary tasks or pleasures of life, have been relieved of the vertigo by correcting astigmatism, often buried under a farsightedness for which they had for many years worn bifocals, or in those having in the glasses they had been wearing an astigmatic recognition which was not correct as to strength and angle. By reason of the abundant literature on aural vertigo, a number of these cases have been referred for ear treatment, but cured by attention to eyes. One old lady of sixty-seven had suffered severely from vertigo for thirty years, so much so that her physician considered it Ménière's disease; she was wearing spherical bifocals. On correcting a moderate amount of complicating astigmatism, she soon became entirely free of her dizziness, and wrote, a few years back, that she had had only one bad spell in three years, which she attributed to overloading her stomach during a hot spell of weather.

In numerous instances patients have refused to believe the constant wearing of glasses necessary, usually stating they could not wear the glasses, enduring their symptoms months or years before settling down to make themselves carry out instructions which brought the desired relief.

When we consider what a transformation in one's

life the uprooting of a small astigmatism can make, we may well conclude that one in the search for it should have the convictions of Columbus that there is something worth searching for, and in finding it, if need be, the patience of Job.

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SOME PRACTICAL CONSIDERATIONS OF SQUINT.*

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Looking at an object with the two eyes open a normal person fixes the same object with both eyes. A squint is present when it is possible for him to fix on an object with only one eye at a time. Divergent squint is the condition when, with both eyes open, one eye is looking at an object and the other one is turned outward, i. e., there is an actual divergence of the visual axes of the two eyes. The deviation is called convergent squint when the squinting eye is turned inward. Also the condition of upward squint and downward squint designates the position of the squinting eye. Therefore it can be said that the character of the squint depends upon the position of the nonfixing eye.

Normally the two eyes are capable of being simultaneously moved in any direction, i. e., up, down, right or left, but in addition to these excursion movements, the eyes perform two very important movements, that of divergence and that of convergence. Divergence of the eyes is produced by simultaneous outward rotation of both eyes. This act of diverging the visual axes is probably produced by simultaneous equal relaxation of both internal recti muscles accompanied by equal simultaneous contraction of both external recti. There is a definite cerebral centre to govern divergence. Neurologists are loath to admit the existence of such a centre, but clinical evidence strongly supports the contention of ophthalmologists that one exists. Dr. Alexander Duane, who has made a very thorough study of the ocular movements, is of the opinion that this centre is in close proximity to the nuclei of the sixth nerves which are situated on the floor of the fourth ventricle near the median line. Errors of diverg-

ence result from an overaction or an underaction of this centre.

A divergence excess is therefore present when the eyes possess an abnormally great power of simultaneous outward rotation. This is a common condition and is the starting point for many divergent squints. It is impossible to inhibit the over-exacting centre, so we have to adopt the measure of weakening the acting muscles. This is done by tenotomies of the external recti muscles. The use of glasses to correct a squint due to divergence excess always results in failure. Operative treatment is the only cure for such cases.

The opposite condition, that of paralysis of the power of divergence, affords a more interesting picture. In this condition there is usually a sudden onset of a distressing double vision (diplopia) for distance, but no diplopia for close range. That the patient has usually detected this is evidenced by his statement that he has diplopia when he looks at a distance, but can see to read without difficulty. There is a marked convergent squint as the patient looks at a distant object, but none as he fixes on a near point. Both eyes can move outward in a perfectly normal manner and there is no limitation of motion of either eye in any field. This normal outward rotation of each eye would differentiate it from an external rectus paralysis, with which it is commonly confused.

Dr. Wheeler, with whom I am associated, reported the following typical case:

CASE.—In February, 1918, a man, W. J., twenty-five years of age, called at the New York Eye and Ear Infirmary saying that on August 1, 1917, while digging a ditch his vision became suddenly confused and since that time he had seen double at a distance. He was in the hospital three months but left unimproved. Vision was normal in each eye; nothing pathological could be found in the interior of either eye. There was no limitation of motion of either eye in any field. There was diplopia at a distance but none for near range. Pupils reacted to light and accommodation in a normal manner. The urine, blood and spinal fluid Wassermann were all negative. In this case paralysis of divergence probably resulted from hemorrhage into the divergence centre while the patient was under physical exertion.

The pathology of such a paralysis is doubtless a lesion in the centre. The most likely causes of such a localized disturbance are lues, cerebral tumor, multiple sclerosis and tabes, but often it is impossible to find any etiological factor. The prognosis for recovery from the paralysis is bad, but usually relief from double vision is achieved by suppression of one of the images. A constant convergent squint is the final result. The knowledge of the existence of such a condition is of importance in that its presence means a definite cerebral lesion and warrants a most thorough examination. It may be the precursor of a much more serious cerebral disturbance.

Convergence is the other unparallel movement which the eyes are capable of performing. Both internal recti muscles contract at the same time and to an equal extent, thereby causing both eyes to be

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turned inward. The act of convergence is also controlled by a cerebral centre. This centre may be overactive or underactive.

Convergence excess is therefore produced by an overacting centre. This frequent anomaly of convergence is responsible for many convergent squints. It is often associated with hyperopia (farsightedness). It is in these cases that glasses do the most good toward correcting the squint.

With an underacting centre we get an insufficient power of convergence. This inability to converge may vary in degree from a slight underaction to a complete paralysis. Many divergent squints result from untreated convergence insufficiencies. There are many causes of convergent anomalies besides refractive errors, but we cannot consider them at this time. However, it is important for us to remember that disorders of convergence produce squints. A convergent squint may be the result of an excess of convergence, or a divergent squint may come from an inability to converge the eyes. This converging power must not be confused with the power of internal rotation. A patient may have normal power of turning each eye in separately, i. e., the power of internal rotation be good in each eye and still be unable to converge. This fact clearly demonstrates that the convergence movement is a separate and distinct function from that of simple inward rotation.

A squint can also be caused by a paralysis of one or more of the ocular muscles. The character of the squint depends upon what muscle is affected. For example, if the right external rectus is paralyzed the right eye will turn inward. There will be limitation of movement of the right eye outward because the muscle which moves that eye out is paralyzed. In paralytic cases, unless they are of congenital origin, the onset is usually sudden. The patient complains of diplopia with its attendant nausea and confusion. There may or may not be an evident squint. A history of the sudden onset of double vision is most suggestive of an ocular muscle paralysis.

Consideration of the etiology of ocular palsies is of interest to the general physician. Syphilis is the most common cause. It is not an uncommon thing in fracture of the base of the skull for a patient to get an ocular muscle palsy from injury to one of the nerves as it emerges from the base of the skull. It occurs as an occasional complication in influenza, diphtheria, whooping cough and in the acute exanthematous diseases. Congenital paralyzes occur not infrequently, and often a case of supposed torticollis is due to congenital ocular muscle paralysis.

The treatment of these acquired paralytic squints is largely that of the underlying cause. If syphilitic in origin give energetic antisyphilitic treatment. In the traumatic cases it is often wisest to do nothing until nature has had time to repair the damage by regeneration. Operative intervention is indicated in the congenital types, but in the acquired paralytic squints give the patients the benefit of thorough treatment before considering operation.

PSEUDOSQUINT OR APPARENT SQUINT.

Having considered the etiological factors in actual squint, we pass now to a most interesting con-

dition, pseudosquint or apparent squint. It is common among children and I believe fully one third of the cases of supposed convergent squint in children belong to this category. The child appears to have crossed eyes but the examination shows no evidence of squint. What then is present? The child's nose has a broad and flat appearance, the bridge of it is underdeveloped. The skin of the nose, instead of being tightly adherent to it, is loosely attached; except at the inner canthal ligament. This laxity of attachment may permit the skin to hang in a vertical fold producing a condition known as epicanthus. The inner canthi are farther apart than normal. This increased distance between the inner canthi is caused by two factors. First, the looseness of the attachment of the skin to the underlying bones and second, the underdevelopment of the bridge of the nose. The position of the eyeball in the orbit is normal and the distance between the nasal orbital walls is no greater than normal. This loosely attached skin therefore covers a part of the nasal portion of the sclera on either side, giving the patient the appearance of having a convergent squint. Such a facial appearance is a characteristic of the Mongolian race. We are all familiar with the peculiar appearance of a Chinaman's eyes. He has this underdevelopment of the nasal bridge which gives him an apparent convergent squint. His nasal bridge never develops so he keeps this condition throughout life. The ordinary child, however, does develop a bridge to his nose and as this development proceeds the skin is drawn inward and forward. In this way the deformity is corrected. A cure then is simply dependent upon full facial development. I cannot stress too strongly the importance of recognition of this condition. The failure of physicians to appreciate this facial change has led to the very widespread belief that a squint will correct itself. I have known of several cases where glasses have been prescribed to correct the squint when only this apparent condition existed. It is not always easy to differentiate these two conditions especially in very young children but a careful examination will definitely establish the diagnosis. The importance of differentiating the actual from the apparent squint is evident, as actual squints demand early treatment and apparent squints need none. Do not tell the parents the child will be all right when he grows up unless you are positive it has only an apparent squint.

The reverse condition of apparent divergent squint is occasionally seen in persons who have a particularly high, narrow nasal bridge. In these cases the skin is stretched tightly over the bony structures and more than a normal amount of scleral tissue is exposed on the nasal side of the limbus. This demands no treatment and is rarely marked enough to be disfiguring.

GENERAL CONSIDERATIONS.

There are certain features of squint cases which are of particular interest to the general physician. He is the man who usually is first consulted about this deformity. What should he do? It is his duty to advocate early treatment in all his squint cases. Do not accept the responsibility of postponing treat-

ment. Put that up to the oculist. The chief reasons for advocating very early correction of the squint are three in number. The first is the loss of vision in the squinting eye. Amblyopia exanopsia as this deterioration in sight from disuse is called, ensues very rapidly in young children. Some oculists contend no such loss in sight can occur yet the clinical evidence strongly indicates its existence. Worth, an eminent English ophthalmologist who has devoted a great part of his time to the study of this problem, says "a child with good vision in each eye who develops a constant unilateral squint at the age of six or eight months will in the absence of proper treatment become rapidly blind in the squinting eye. This loss of vision in the infant's deviating eye is so rapid that the power of central fixation is often lost within eight to ten weeks." The older the child the less rapid is the loss of vision. After six years of age amblyopia exanopsia rarely takes place to any marked extent. Acquired amblyopia is a true loss of vision, not a failure of function to develop. Not every case of squint develops this amblyopia, for in some we see first one eye fixing and then the other. It is in the unilateral squint that this gradual loss of vision does its greatest harm.

There is another or second important reason for the early correction of the squint. A permanent loss in the ability to use the two eyes together occurs in practically every squint of long standing. Binocular single vision is affected by a psychical blending of the two sets of visual impressions into one composite picture. According to Worth, the power of fusion of the images of the two eyes begins development very early (by the end of the first year) and is considered complete by him at the end of the sixth year. It is impossible for the mind's eye to fuse the images of the two eyes into one when a squint is present, therefore to him everything appears double. Children readily overcome this double vision by ignoring the image of one eye. This necessitates the using of only one eye at a time. Therefore, unless the squint is corrected early, the ability to use the two eyes together is lost and never regained. With only monocular vision it is impossible to judge distances accurately or to appreciate fully the sense of depth. The possession of this faculty of binocular vision was considered important in the army air service. Without it no one could qualify as a flier, for in aviation accurate estimation of distances is often essential.

The third or cosmetic reason for the early correction of squint is the one which usually brings the patient to consult an oculist. The unfortunate cross-eyed child is greatly handicapped. Children poke fun at him; call him "Mamma's crosse-eyed baby." He is very sensitive about it. He becomes shy and backward in school. He avoids his playmates, and becomes of a sullen, disagreeable nature. Early correction of the squint removes the possibility of such a change occurring in the child.

To summarize, then we should advise early correction of squint, 1. To prevent amblyopia exanopsia (loss of sight from disuse. 2. To preserve the ability to use the two eyes together. 2. To remove the deformity which is a genuine handicap to the development of the child's mind and body.

TREATMENT.

How should a squint be treated? Every case of squint should receive a most careful eye examination. The first duty of the oculist is to find out what is causing the squint. If the refraction of the eye be a factor, correct that, but most ophthalmologists make the mistake of considering every case of squint one of only refraction. Do not tell your patients with squint that it is simply a matter of glasses. Too many other factors have to be considered to warrant such a broad statement. Many squints do not require glasses and some are even made worse by the use of them.

If the squint is due to a syphilitic muscle paralysis glasses will not help but antisyphilitic treatment will. In every case of squint a most careful search for the cause of the actual condition should be made and your treatment be directed toward the correction of the productive factor. The nonoperative treatment should therefore be strictly causal in nature.

Many cases require operative interference. The age at which operation should be advised is an important consideration. There is a widespread belief among practitioners and oculists that it is unwise to operate on any patient with squint under ten years old. Parents are therefore continually being told to wait until the child is older before thinking of operation. We have already considered the great harm resulting from such neglect. Operative measures are indicated as soon as you have satisfied yourself that nonoperative treatment will not cure the patient. It does not matter whether the patient is two or twenty, if operation is indicated, operate. Good results follow early correction. Operate when necessary to correct the squint regardless of the age. The youngest patient I have heard of was two years old at the time of operation, but I see no reason why if the case required operation it could not be done at an earlier age than this.

We have in general two operative procedures: 1. A weakening of an overacting muscle; 2, a strengthening of an underacting muscle. The tendon of the muscle at its insertion into the globe is severed either partially or completely to effect this weakening in the tenotomy operation. There are two ways of increasing the action of a weakened muscle; first, the tendon can be shortened or resected, second, the insertion of the muscle can be carried further forward (near the limbus), in other words, advance the insertion. It is quite often necessary in squints of long standing to combine a resection of one muscle with a tenotomy of its antagonist. Cocaine anesthesia for these operations can be effectively used on young children. Local anesthesia has to my knowledge been used with perfect success in a patient six years old.

In conclusion let me again call to your attention these considerations:

1. That the existence of divergence as a separate and distinct function from that of external rotation is an established fact. Also that convergence is not simply an act of internal rotation but that it is a distinct entity. The performance of these movements are controlled by cerebral centres.

2. Pseudosquint is a common condition, the ex-

istence of which is responsible for the very strong belief that a squint corrects itself in time.

3. An actual squint demands early correction to save the vision in the squinting eye, to preserve the ability to fuse the images of the two eyes, and to remove the deformity which is a great handicap to the child's progress.

4. Operate when indicated regardless of age. No bad effects result from early operation. Much is lost by waiting.

80 WEST FORTIETH STREET.

MEDICAL MEN IN THE AMERICAN REVOLUTION.

The New York Campaign of 1776.

BY LOUIS C. DUNCAN, M. D.,
Washington, D. C.,

Lieutenant Colonel, Medical Corps, U. S. Army.

(Continued from page 416)

6.—RESOLVED:

That every director of a hospital possesses the exclusive right of appointing surgeons and hospital officers of all kinds, agreeable to the resolution of Congress of the 17 July, in his own department unless otherwise directed by Congress. That Dr. Stringer be authorized to appoint a surgeon for the fleet now fitting out on the lakes.

That a druggist be appointed at Philadelphia whose business it shall be to receive and deliver all medicines, instruments, and shop furniture for the benefit of the United States. That a salary of thirty dollars a month be paid to said druggist for his labor.

"Congress proceeded to the election of a druggist and the ballot being taken, Dr. Wm. Smith was elected."

This druggist appears to have been a storekeeper, or medical supply officer. The medical committee of Congress seems to have done the purchasing.

GENERAL GREENE'S LETTER TO WASHINGTON.

Camp at Long Island, *August 11, 1776.*

7.—Dear General:

There is no proper establishment for supplying the regimental hospitals with proper utensils for the sick; they suffer for want of proper accommodations. There is repeated complaint on that head. The regimental hospitals are and ever will be rendered useless, nay grievous, unless there is some proper fund, to provide the necessary conveniences. The general hospital cannot receive all the sick: and those that are in the regimental hospitals are in a suffering condition. If this evil continues, it must injure the service, as it will dispirit the well, to see the sick suffer, and prevent their engaging (enlisting) again, upon any conditions whatever. Great humanity should be exercised toward those indisposed. Kindness on one hand, leaves a favorable and lasting impression; neglect and suffering on the other, are never forgotten.

I am sensible there has formerly been great abuses in the regimental hospitals, but I am in hopes men

of better principles are elected to those places, and that the same evils will not happen again. But the Continent had better suffer a little extraordinary expense, than the sick should be left to suffer, for want of those conveniences so easily provided.

I would beg leave to propose that Colonels of regiments be allowed to draw monies, to provide the regimental hospitals with proper utensils; an account of the disbursements, weekly or monthly, to be rendered: This will prevent abuse and remedy the evil.

Something is necessary to be done, speedily, as many sick are in a suffering condition.

The general hospital is well provided with everything and the sick are very comfortable. I wish it was extensive enough to receive the whole, but it is not.

I am, your Excellency's most obedient servant,
NATH. GREENE.
August 13, 1776.

8.—"Doctor John Morgan, Director General of the Hospital, attending, was admitted. He informed the convention that General Washington had directed him to have all the sick removed to proper places out of such parts of said city as are closely built and inhabited; that a list of houses had been handed to him for that purpose, by private persons, but that as he is a stranger, and does not know what particular persons might be proper to be exempted, and, therefore requests the direction of the convention in the premises.

Resolved that his Excellency General Washington be and is hereby empowered to apply the following houses, to wit:

Mr. Aplethorpe's,

Oliver Delancey's and

Robert Bayard's at Bloomingdale.

William Bayard's, at Greenwich.

Mr. Watts', near Kipp's Bay, [East 34th St. now].

Robert Murray's, on Jacklam Bergh.

Mr. Wm. McAdam's, and the houses and buildings occupied by Mr. Watson near the old glass house.

Nicholas Stuyvesant's, Peter Stuyvesant's, Mr. Elliott's.

Mr. Horsemanden's commonly called Frog Hall.

Widow Leake's, near Kipp's Bay; for the use of the general hospital of the Americans.

Ordered, That the General Committee of the City of New York do, on application of Dr. John Morgan, Director of Hospitals of the Continental Army, appoint a proper committee of their body, to ascertain and designate to him such houses on Nassau Island, to be by him used as a general hospital, as he may from time to time have occasion for that purpose."

9. AMERICAN ARMY ON LONG ISLAND:

Major General Israel Putnam, Commander; Right Wing, General Lord Stirling—Kichline's Pennsylvania Rifle Battalion, Atlee's Penn. Regt., Smallwood's Maryland Regt., Haylet's Delaware Regt., Huntington's Connecticut Regt.

Left Wing, General Sullivan—Miles' Pennsylvania Rifle Battalion, Bedford Pass; Henshaw's Massachusetts Regt., Johnston's New Jersey Regt., Hand's Pennsylvania Regt.,

Prospect Hill, Wylley's Connecticut Regt.,
Bedford Pass.

Reserve—Little, Hitchcock, Chester.

Two brigades came over after the battle.

Total about 8,000.

Total strength of the American Army August
3rd—Total present and absent, 17,225; sick,
3,678; total effective for duty, 10,514.

10.—BRITISH FORCES AT BATTLE OF LONG ISLAND.

Advance Guard—4 Battalions Light Infantry
and Light Dragoons.

Reserve—4 Battalions Grenadiers, 33 and 42
Foot.

1st Brigade—15, 27, 4, 45 Foot.

2nd Brigade—5, 28, 49, 35 Foot.

3rd Brigade—10, 37, 38, 52 Foot.

4th Brigade—17, 40, 46, 55 Foot.

5th Brigade—22, 43, 54, 63 Foot.

6th Brigade—23, 57, 64, 44 Foot.

7th Brigade—71st, New York Companies, Ar-
tillery.

De Heister, Hessians—Three brigades of three
regiments each; one brigade of two regi-
ments.

Total, forty-three regiments, besides artillery
and small detachments. The total was at
least twenty thousand officers and men—
probably somewhat more than that number.
Some of the regiments were large; the 42nd
numbered 1,168 and the 71st 1,298.

The returns of the British Army on August
27th showed present 26,247 (excluding Roy-
al Americans) and 24,464 effectives.

HQRS. LONG ISLAND, *Aug. 29th.*

11.—Parole Sullivan. Countersign Green.

As the sick are an incumbrance to the Army,
and troops are expected this afternoon from the
Flying Camp in Jersey, under General Mercer,
who is himself arrived, and cover is wanted for the
troops, the commanding officers of regts. are im-
mediately to have such sick removed. They are to
take their arms and accoutrements and be con-
ducted by an officer to the General Hospital, as a
rendezvous, and there to cross together, under the
directions of the person appointed there, taking
general directions from Dr. Morgan. As the above
forces, under General Mercer, are expected this
afternoon, the General proposes to relieve a pro-
portionate number of regiments, and make a change
in the situation of them.

Morgan says that in part of a day and night
several hundred sick and wounded were transported
from Long Island, in a heavy rain which fell dur-
ing the retreat. They were landed at different
wharves and carried to different houses, while he
and his officers had great difficulty in collecting
them in the barracks and hospitals that he had
provided. All possible care was taken, yet some
unavoidably suffered. He gave his personal assist-
ance in dressing the patients, and states that there
was not a single wounded man brought to the
General Hospital in New York (Kings College)
that he did not himself dress. He also assisted in
the operations and visited officers and men outside
the hospital, either alone or in consultation. These

statements give us a better idea of the activities of
a medical director at that time, and more especially
of the energy of Dr. Morgan, who did the work
of superior and subordinate so well that there was
never a complaint of the hospitals where he was
present. The wounded in this case were not in
great numbers, the best estimate being that few
more than fifty seriously wounded escaped from the
affair on Long Island.

The army had scarcely arrived in New York
when the necessity for abandoning the place ap-
peared. On September 5, General Greene urged
that the city be abandoned and burned. On the
seventh a council of war decided on the half mea-
sure that nine thousand men should retire to Harlem
Heights, leaving Putnam with five thousand in
the city. Heath commanded a reserve of two
brigades, and Mercer was in the vicinity of Fort
Lee with the Flying Camp. It was determined to
send the sick to Orangetown, New Jersey, and to
the barracks at Kingsbridge.

Conditions in the city soon became unhealthful.
The letters of Dr. Solomon Drowne, a hospital
mate, to his father picture the rapid change. He
wrote:

June 4th. We arrived yesterday. We waited on Dr.
Morgan today and were kindly received. He mapped
out a course of duty for us at the Hospital, which will
keep us very busy. The College is occupied for the gen-
eral hospital. It is a very elegant building and its situa-
tion is pleasant and salubrious. . . . I have a list of
medicines, purchased here for ye Continental Hospital,
to copy for Dr. Morgan, which obliges me to conclude.

June 17th. As there happened to be some vacancies in
the hospital I have as good a berth as I could have wished
for (the same as Dr. Binney's). We draw twenty dol-
lars a month and two rations per day. . . . We have
been closely employed a good part of ye time, assorting
and putting up medicines for thirty chests.

August 9th. Our wages were raised some time ago (in
consequence of a petition to Congress) to thirty dollars
per month. The pay would be no inducement to stay a
minute in this stinking place, at the expense of health, that
best of blessings. The air of the whole city seems in-
fected. In almost every street there is a horrid smell.

Dr. Morgan had a reserve of stores collected
which, before the evacuation, were sent to Stam-
ford, Connecticut. Had this not been done they
would have been captured. He says:

It being in the most violent heat of summer, and so the
less wanted, I ordered the greater part of the rugs and
blankets, the newest and best beddings, of which I had
collected a very large stock, and a thousand sheets, of
which I had lately got to the amount of nearly two thou-
sand, many of them new, and a number of shirts, at New
York, to be set apart for the purpose, and a large quantity
of heavy hospital furniture, some of the largest bell metal
and iron mortars, a number of crates of vials and jelly
pots, the largest bottles, with the most bulky articles, and
those in the least demand, as some hogsheds and casks
of cascarilla, and other such particulars as we could best
spare, to accompany them. To these I ordered, a share of
whatever we had in so great a plenty, as to not fear being
soon destitute of them: to be added with a small assort-
ment of chosen medicines, to be made up and kept together
in one or two suitable boxes as a reserve.

A vessel was found and these stores set off, under
charge of Dr. Ledyard. They were landed at
Stamford and taken charge of by John Lloyd, Esq.,
in his own house. Later, in fear of a landing by
the enemy, the general ordered them moved some
fifty miles into the country.

A branch of the General Hospital was later

established by Dr. Philip Turner at Norwich, where their stores were doubtless used to advantage. Had they been held in New York they would have been lost, yet Morgan was blamed at the time for sending them away.

The morale of the army at this time was not high. It was composed of a heterogeneous mass of men of all ages, from all the colonies, with a large proportion of militia. The defeat on Long Island was depressing, and on top of that came the news of failure, suffering and death in Canada. The first enthusiasm had waned, and the formidable army assembled by Britain, together with a powerful navy, were things to give pause. Above all, there was now much sickness. During the siege of Boston there had been comparatively little serious disease; now there was a great deal. Dr. Rush says: "It was not until the troops of the eastern, middle, and southern states met at New York and Ticonderoga in 1776, that the typhus became universal and spread with such mortality in the armies of the United States." Rush also says that "the southern troops were more sickly than the northern or eastern troops." This was due to the fact that there was in the south a class of poor whites, not known in New England and the middle colonies. To these may have been due the typhus which ravaged the army. Dysentery was now common in the camps of the Americans and also of their opponents; but usually not of a fatal type. Early in September three additional battalions were ordered up from Virginia, and two from North Carolina. Of those from Virginia (the 4th, 5th and 6th Regts.) nearly one half of the men were sick. A return of the army at the middle of September showed that of the rank and file there were present, fit for duty, 15,243; present sick, 6,098; absent sick, 1,215. The total number of sick was 8,528, more than a third of the army.

Washington was holding on to New York and the sick not yet evacuated. On the 8th of September he asked the New York Convention for four large sloops for this purpose, having no wagons to spare; and on the 12th he wrote again, saying that the vessels had not yet arrived. Dr. Morgan made a considerable tour through western New Jersey in search of a site for the general hospital. On his return he wrote to Washington (September 12th) (12) stating that no suitable place could be found in Orange County, but that Newark was satisfactory, and that the patients could be transported there almost entirely by water carriage; only four miles would be by land transport. Meanwhile, events were compelling action.

On September 9th the British had landed on Blackwell's Island. General Greene again called for a council of war, and this time it was decided that the city must be given up. There was still a large number of sick, more than could be moved in a regular manner. As a necessary measure, Morgan agreed to a plan of Greene's, that the regimental sick of each brigade be collected in a body, placed in charge of a medical officer, and sent off into the country (New Jersey). All not able to move themselves were ordered sent to the general hospital. This measure of necessity produced endless

irregularities and confusion. The sick escaped from all control. Some surgeons also remained away and did not rejoin the army. At the next battle, the White Plains, few regimental surgeons were present, and Morgan was obliged to care for the wounded on the field, as well as at the general hospital at North Castle. The removal of the slightly sick, convalescents, and malingerers left several hundred seriously sick still in the city. Morgan said of the brigade plan: "I am still of the opinion it was the best step that could have been taken to prevent the sick falling into the hands of the enemy, unless, what I mentioned to your Excellency as my wish could have been accomplished, viz.: That protection might be granted to the hospitals on both sides, and the sick not become prisoners of war, but their person and attendants might be privileged and safe, as was the case between the French and English in the wars of Europe." This letter to Washington shows that Morgan understood the principles now embodied in the Geneva Convention. He had served in the last Colonial War and must have been familiar with the practices of the French and English in that war.

On September 15th matters came to a crisis in New York. The British sent war vessels up the Hudson, and at the same time landed at Kipps Bay on the east side of the Island. A brigade of militia ran away, leaving Washington alone and exposed to capture within a hundred yards of the enemy. This is one of the occasions on which he is said to have lost control of his temper. Putnam made his escape to Harlem Heights, in some confusion, with the loss of 275 prisoners, the heavy guns and much supplies. Washington said, "Most of the heavy guns and part of the stores were lost." The loss of stores was due to lack of wagons. He says that the removal of the sick was "completely effected." In a letter to John Augustine Washington he says that they "held on till the sick and wounded were sent away." A more exact statement would be that they got the sick away before they were obliged to leave.

The state of the army after the battle on Long Island was such as to occasion alarm in the mind of John Adams, Chairman of the Board of War and virtual head of such war department as then existed. On September 19th he secured the passage of a resolution requiring daily drills. He said:

This resolution was the effect of my late journey through the Jerseys to Staten Island. I had observed such dissipation and idleness, such confusion and distraction among officers and soldiers, in various parts of the country, as disturbed, grieved and alarmed me. Discipline, discipline, had become my constant topic of discussion. . . . I saw very clearly that the ruin of our cause and country must be the consequence if a thorough reformation and strict discipline could not be secured.

On September 20th he secured the adoption of a set of articles of war, which was practically the same as the articles of the British Army. The British articles were, as he says, a literal translation of the *Articles of War of the Roman Army*.

As before mentioned, Morgan had inspected buildings for a general hospital in Newark. Dr. Foster and Dr. Burnet (13) were placed in charge of this hospital, with seven or eight mates,

and it was prepared for a thousand patients. Part of the medicines and stores at New York were ordered over by the Adjutant General (Reed), and to his personal activity it was due that they were saved. But the valuable part still remained in New York after the British had landed and were supposed to be entering the city. Morgan himself then went back in a boat with some assistants and saved these stores, "like a brand from the burning," as he says. He had previously sent two chests to Kingsbridge for hospital use. His own words give the best description of the evacuation of the sick and wounded from New York.

The sick and wounded above mentioned were landed at Hoebuck and Wehock, &c. Some of our mates fell into the hands of the enemy, and many of the nurses and waiters fled, and the militia ran off and impressed every wagon they could find in the neighborhood.

In another place he describes the actions of the militia:

I have been an eye witness myself to whole battalions running off from Powle's Hook and the Heights of Bergen, upon the firing of a broadside from a man of war . . . although not a man was hurt by that fire. These doughty champions never stopped till they came to Second River, but forced away the very wagons impressed to transport the sick and those wounded at Long Island, to Newark; to carry off themselves and baggage, for many of them chose to ride, to save their legs, in case of being more nearly pursued.

It therefore required some days to get on all the sick and wounded, through many difficulties, from the fright of the inhabitants, and their reluctance to admit of the hospitals being stationed at that place (Newark). I had provisions to collect, a commissary and wardmaster to seek, and nurses and waiters to procure, with everything necessary for the comfortable accommodation of the sick and wounded. I had little enough assistance to perform this task: Your Excellency having enjoined me to leave the most considerable number of surgeons and mates at York Island, in case of need. I made all possible haste, however, to put the hospital at Newark on a safe footing, which I accomplished in about ten days, and then returned to headquarters.

Morgan was even blamed in this affair and feelingly wrote:

All the consequences of the sick suffering for want of necessities—sad spectacles of human woe, presenting themselves in towns, villages and on the roads, and straggling through the country, thereby exciting the terror as well as the compassion of the inhabitants—have been ascribed to my department and the officers under me, at a time when we ourselves suffered and called in vain for assistance from other departments, and, so far as we were able, became fatigue men and laborers to the sick and wounded, as we could procure none from the Army, and, as I mentioned before, many of our attendants and nurses had fled.

This hospital remained at Newark until the advance of the British in November compelled the removal of the sick to Morristown and then to points in Pennsylvania.

On September 19th, Dr. Shippen wrote a rather boastful letter to Congress (from Perth Amboy), informing them that "all the wounded from Long Island were now recovered." These wounded men were never in his charge at any time. He also stated that he had lost but ten or twelve men of twenty or thirty thousand passing through camp. Not half that number could possibly have passed through the Flying Camp. It will be remembered that Dr. Shippen was made medical director of the Flying Camp on July 15th. Al-

though without previous military experience, he soon aspired to a much loftier position and took advantage of his station at or near Philadelphia to ingratiate himself with the members of Congress. He was a born courtier, of good professional ability and high social standing and without fine scruples. While Morgan was in the field, riding on horseback hundreds of miles, gathering supplies from Boston to Baltimore, providing hospitals, instructing incapable surgeons, wrestling with insubordinate officers, and doing surgery with his own hands, Shippen was working on the members of Congress, whose fears were excited by the numerous complaints of conditions which neither Morgan, Shippen, nor anyone else could then have remedied. The bulk of the real complaints came from the Northern Army, where Medical Director Stringer had from the beginning denied and resisted Morgan's authority. Even then Morgan had sent what supplies he could collect and had given what aid was possible. Washington was not approached or consulted in a scheme which was now under way to supplant Morgan. On October 9th Congress passed a resolution (14) dividing the jurisdiction; giving Morgan control of the hospitals east of the Hudson, and Shippen control of those west of that river. This was an indefensible plan, which left no head to the Medical Department, and was sure to bring about confusion and failure. It was most probably a step toward the elimination of Morgan and the placing of Shippen in the supreme position. Meanwhile, Morgan was everywhere, doing everything—except playing politics.

During the absence of Morgan there seems to have been no general hospital with the army at Harlem Heights. On September 18th an order was issued to this effect:

The Regimental Surgeons are to take care of their own sick for the present, until the general hospital can be established on a proper footing. They are to keep as near the regiments as possible, and in case of action, to leave the sick under the care of their mates, and be at hand to assist the wounded.

The headquarters were then at Morrisania. General Greene had command on the Jersey side. Sickness continued and even increased. The sick filled houses, barns, outbuildings; they even lay under trees and in fence corners. Washington was not unmindful of them, and on September 16th—an eventful day—a letter was written asking that the pay of nurses be increased (15). He also asked Congress for camp kettles, tents, blankets, and other necessities, to replace those lost during the retreat from New York. Several hundred carts and wagons had been sent to Long Island in July; when the retreat took place they were lost. So when the army retired from the city there were few wagons for baggage, and the camp equipage of tents and other essentials of Putnam's regiments were left behind.

Washington wrote Congress again, on September 24th, concerning the surgeons as follows:

No less attention should be paid to the choice of surgeons than to other officers of the army. They should undergo a regular examination, and if not appointed by the director general and surgeons of the hospital, they ought to be subordinate to and governed by his directions.

The regimental surgeons I am speaking of, many of

whom are very great rascals, countenancing the men in sham complaints to exempt them from duty, and often receiving bribes to certify indispositions with a view to secure discharges or furloughs.

But independent of these practices, while they (the regimental surgeons) are considered as unconnected with the general hospital, there will be nothing but continual complaints of each other—the director of the hospital charging them with enormity in their drafts for the sick; and they him for denying such things as are necessary. In short, there is a constant bickering among them, which tends greatly to the injury of the sick, and will always subsist till the regimental surgeons are made to look up to the director general of the hospital as a superior. Whether this is the case in regular armies or not, I cannot undertake to say; but certain I am, there is a necessity for it in this, or the sick will suffer. The regimental surgeons are aiming, I am persuaded, to break up the general hospital, and have in numberless instances drawn for medicines, stores, etc., in the most profuse and extravagant manner for private purposes.

Washington was not deceived in any of these things; his observations were remarkably accurate.

A considerable number of barracks and huts were built at Harlem Heights and Kingsbridge. The men were crowded in these, and the sick increased. Dysentery and typhus were the principal affections. Little mention is made of smallpox. As a rule, the men in the army about New York had by this time had smallpox, either in the natural way or by inoculation. Surgeon James Tilton of the Delaware regiment afterwards wrote of the sickness which he saw at this time:

In the year 1776, when the Army was encamped at King's Bridge in the State of New York, our raw and undisciplined condition at that time, subjected the soldiers to great irregularity. Besides a great loss and want of clothing, the camp became excessively filthy. All manner of excrementitious matter was scattered indiscriminately throughout the camp, insomuch that you were offended by a disagreeable smell, almost everywhere without the lines. A putrid diarrhoea was the consequence. The camp disease, as it was called, became proverbial. Many died, melting as it were, and running off at the bowels. Medicine answered little or no purpose. A billet in the country was only to be relied on. When the enemy moved to the East River, our army moved to White Plains and left their infectious camp and the attendant diseases behind them. It was remarkable, during this disorderly campaign, before our officers and men could be reduced to strict discipline and order, the army was always more healthy when in motion, than in fixed camps.

I recollect in the campaign of '76, while our army was on the peninsula of New York, we were so deranged as to be deprived of ovens, and flour was served to the troops instead of bread. We could only make sodden bread and dumplings. Some baked their bread on hot stones, and others in the ashes. The consequence was that many were afflicted with the jaundice. Being a regimental surgeon at that time, I shared the fate of the rest, and shall never forget my fatiguing march from the North River to Brunswick, with the jaundice on me.

A return of the army under Washington on the east side of the river, of September 30th, shows that of the rank and file there were: Present, fit for duty 15,104; present sick, 4,211; absent sick, 3,399; total sick, 7,610.

General Greene had at Fort Washington and on the west side of the river 3,531 present fit for duty; 964 present sick; and 259 absent sick. A considerable part of both forces was made up of the militia, which was poorly equipped and had little or no tentage. An order of September 30th directed the militia to "build huts with straw, rails, and sod, on the Morrisania side of the Harlem." An order of the 28th directed that the boards sent up for

tent floors be not used for building up walls. On October 4th an order was issued bearing on the situation of the camp.

Orders:—The shameful inattention, in some camps, to decency and cleanliness, in providing necessaries, and picking up the offal and filth of the camp, have been taken notice of before in general: after this time particular regiments will be pointed out by name when such practice prevails.

At this time an engagement was generally expected. General Heath issued an order of battle for his division on October 3rd, in which provision was made for attention to the wounded. "A stout, able-bodied man of a (each) company is to be appointed, who, with the camp colourmen and musick, are to assist the wounded."

The British having landed at Throg's Neck, the Continental Army was drawn back to the line of White Plains, early in October. It was now organized in four divisions under Lee, Heath, Sullivan and Lincoln. Greene was allowed to leave twenty-seven hundred men in Fort Washington. This was contrary to the judgment of Washington. For once, as Reed intimates; the decision of the great man faltered, and the foundation was laid for adding another to the growing list of disasters.

When Morgan returned from Newark to headquarters he received a letter from one of the aides-de-camp "setting forth the miserable situation to which the sick were reduced, and the clamor for want of medicines, absolutely insisting on immediate and sufficient supply," and saying that, "whilst he was reserving the medicines for cases of emergency, the sick were dying in numbers, for want of a necessary supply." Morgan had just sent to Mr. William Smith, the continental druggist at Philadelphia, with what success may be judged. "Instead of ten pounds of tartar emetic I sent for, four ounces were all I could obtain." He then induced a regimental surgeon to go at once to Hartford, Norwich, Providence and Boston, to procure medicines; but these places were so very bare of them that he was greatly disappointed in the outcome. He next applied to Governor Trumbull of Connecticut, and in person to the Assembly of New York at Fishkill. He found that the stock owned by this state had been sent to the Northern Army. Governor Trumbull collected a supply for him, but it did not reach the army until November.

This was an incident in his labors. As has been stated, the general hospital with the army suffered while he was away; rather, it ceased to exist. It was necessary to establish it again. As the army was then looking toward New Jersey, he decided to establish a hospital at Hackensack. He says:

I recommended Hackensack. Every general officer, to whom it was mentioned, approved of it, as the most suitable place of all others for the sick of the army on York Island, there being no such convenient place on the Island itself, and the enemy had just made a descent about Kingsbridge. I was ordered over the river to view Hackensack (probably about October 1st) and to report what number of sick could be provided for at that place. On my return I did accordingly report that if a sufficient number of carpenters and masons were set to work immediately, to fit up the church, manufactory, and a storehouse or two, &c., six or seven hundred men, and perhaps more, might be accommodated in the town and neighborhood; but it would require many workmen and some time to prepare places for their convenient reception. I was

then ordered back to carry the plan into execution with all possible diligence. I went accordingly, and next day no less than three hundred men (sick) were brought into the neighborhood for me to look after, though I was quite alone in respect to help. They daily increased in numbers, so that within a few days they amounted to upwards of a thousand (16). I had left instructions for Dr. Warren, and a number of mates and other hospital officers to follow and attend the sick. At first we had neither bread, flour, nor fresh provisions in readiness, nor were Commissaries at hand, from whom I could obtain any help. General Greene, to whom I sent to Fort Lee for assistance, was gone over to York Island. So soon as my hands were strengthened with Dr. Warren's and Mr. Zabriskey's help, and the appointment of a commissary and quartermaster, difficulties abated by degrees, and our affairs got into a more promising train. In the meantime, the armies having reached toward the White Plains, a battle was expected. I therefore hastened to join your Excellency. (This seems to have been about October 25th.)

The British had slowly moved forward, and toward the end of October were ready to attack. Morgan found that the surgeons with the army had fixed upon the church at North Castle as a convenient place for the wounded and at a suitable distance from the expected conflict at the White Plains. He set about preparing the place, but before it could be done the battle began. As mentioned before, many of the regimental surgeons were absent, having gone off with their sick and not returned. Morgan learned of this and went at once to the field to supply this deficiency. He says:

While we were getting in readiness, a firing of cannon was heard anew, for there had been a firing heard the day before at Fort Washington. On learning it was at the White Plains, every surgeon of the hospital then present set out with me, immediately for the Plains, several mates following with a waggon, to bring the instruments and dressings. We fixed (located) near the lines, and I never stirred from thence till the enemy retreated, which was about a week later; nor till Your Excellency crossed the river to hasten to the support of Fort Washington (about Nov. 12th). In the meantime the situation of affairs would not permit Your Excellency to give me leave to return to North Castle, but for a few hours, to give directions, and to assist in providing for the sick and wounded; one hospital surgeon, and sometimes two or more, with three or four mates, attending the whole time at the Plains, in expectation of a second attack.

(To be concluded)

LONDON LETTER.

(From our own correspondent)

Medical Education in Great Britain.

LONDON, August 27, 1920.

The question of medical education is of intense interest to medical men in all parts of the world. It is in a state of flux in Great Britain, or, more correctly, it is in a state of transition. It is believed that too much attention is paid nowadays to bacteriology to the neglect of clinical medicine. The argument is made that it is the clinical experience which counts, for if one cannot make a correct diagnosis without always resorting to the services of the laboratory man, then the practice of medicine is in a parlous condition. It must be remembered that the largest proportion of medical practice is in the hands of the general practitioner, who has to rely on his own trained powers of diagnosis and in the vast majority of cases must dispense with the aid of the laboratory. The time may come, and it will

come if the Consultative Council of the Ministry of Health has its way in England, when the general practitioner will have at hand facilities for laboratory aid. This does not mean, of course, that the student should not be thoroughly trained in clinical methods of diagnosis. The laboratory should be the coadjutor to clinical methods and must not be allowed to dominate the situation.

It is painfully evident that in this country, and probably also in all civilized countries, the medical curriculum is far too comprehensive. Sir George Newman, chief medical adviser to the British Ministry of Health, in an excellent review of the state of medical education in England, which he presented at the recent meeting of the British Medical Association, emphasized these points. He declared that the medical curriculum required lightening at both ends and that the question of lightening without lengthening the curriculum was one of cardinal importance. He suggested several ways to accomplish this object and ended by stating that in his opinion there was need of further state aid, but with a minimum of state control. He pointed out that the cost of proper medical training has now risen beyond the means of the average man, and yet it was in the interest of the state to secure well equipped doctors. To provide a satisfactory medical education more teachers were needed, better teachers and better paid teachers. Clinical units were needed. Improved laboratory accommodation and better equipment were needed. An extension of hospital and clinical facilities were needed. All these called for money and organization which had been lacking in the past. As Sir George Newman truly said, the education of the medical man was no longer a matter of proprietary or professional interest, it was of national concern, for the health of the people was the principal asset of the state. Other well known authorities on medical education aired their views and it is obvious that while on some points they did not agree, they were unanimous in believing that there should be changes introduced into the methods of British medical education.

In the Student's Number of the *Lancet* an exhaustive account is given of medical education in Great Britain and it will not be out of place to quote some of the statements with regard to the powers, duties, and constitution of the General Council of Medical Education and Registration of the United Kingdom. It is first a registering body; no person, even though he has the proper qualifications, is a legally qualified medical practitioner unless his name appears on the medical register. Secondly, it is a standardizing body, insuring the keeping of medical education up to efficient standard by scientific examinations. Thirdly, it is a plenary and disciplinary body, having power to remove from the register any practitioner adjudged guilty of conduct "infamous in a professional respect." Fourthly, to the council is committed the codification of pharmaceutical remedies. The council at present consists of thirty-eight members, of whom all but eleven are official representatives of some corporate body. Five members are chosen by the Crown on the advice of the Privy Council and six others are elected by the members of the medical profession as direct representatives.

The educational curriculum is as follows: The course of professional study after registration occupies at least five years. The final examination in medicine, surgery and midwifery must not be passed before the close of the fifth academic year of medical study. The following are the General Medical Council's regulations in reference to the registration of students in medicine. Every medical student should be registered in the manner prescribed by the council, and the registration of medical students is placed under the charge of branch registrars. Every person desirous of being registered as a medical student should apply to the branch registrar of the division of the United Kingdom in which he is residing and should produce or forward to the branch registrar a certificate of his having passed a preliminary examination as required by the General Medical Council and evidence that he has attained the age of sixteen years, and has commenced medical study at an institution approved by the council. The branch registrar shall enter the applicant's name and other particulars in the students' register and shall give him a certificate of such registration. The commencement of the course of professional study recognized by any of the qualifying bodies should not be reckoned as dating earlier than fifteen days before the date of registration. In addition to the universities and schools of medicine, there are many institutions where medical study may be commenced.

The one change in the development of medical education which has taken place recently in some of the British medical schools is the establishment of clinical units. Sir George Newman referred to this matter in the address quoted previously and, while protesting that there was nothing celestial about the clinical unit, said that it was merely a matter of convenient arrangement by which three general advantages were secured. 1. The clinical teacher devotes a regular and substantial proportion of his time to his teaching work and instead of being casual, secondary, incidental or spasmodic, it becomes his chief task, and for the student instruction in clinical medicine and surgery is thus systematized, thorough and always available. 2. The unit consists of a staff of competent men working as a group or team who pool their experience—the physician, the assistant physician, the resident physician, the house physician, wards, outpatient department, laboratory, auxiliary departments for special forms of treatment, all in a composite unit. 3. There is full integration of the science and art of medicine and surgery, the teaching of which may thus be raised to university standards. There is the association of research with study, and the study itself is intimate and intensive. It should comprehend Sir James Mackenzie's subjective and associated phenomena, it should investigate the mechanism of symptoms, and it should follow end results back to their origin. The example on the largest scale in Great Britain is at Edinburgh, where there are seven surgeons in the unit; Sir Harold Stiles is regius professor of clinical surgery, with an assistant surgeon, a clinical tutor, and a house surgeon. The unit contains forty-four beds, outpatients and laboratory accommodations adjoining.

The work of the week comprises ward clinics, systematic clinical lectures, tutorial classes and operations. There is intensive study of the cases and exceptionally full integration of anatomy and pathology with surgery.

In the Student's Number of the *Lancet* a leading article is devoted to medical training and the clinical units and a lucid explanation is given as to why such a development was called for. It is pointed out that the time was when the whole of medical education was in the hands of the working leaders of the profession and progress was great in those simpler days. But as learning became more intense, as well as of a greater range, the preliminary and intermediate subjects passed into the hands of teachers with special equipment, the instruction in the principles of medicine and surgery being left to the honorary staffs of the voluntary hospitals. These men earned their living by private practice, carried on during time that was already heavily pledged to gratuitous labor in the wards. Scientific research and systematic teaching of the students were prosecuted in addition to their duties to private and hospital patients and with results of which all may be proud. But the strain was obviously too great, while in election to the honorary staff capacity or inclination for teaching carried but little weight. Nor was the appointment of the clinical teachers under the control of the medical school attached to the hospital, so that every teacher was a law unto himself, and the whole organization was at the mercy of the less conscientious members of the staff. That these were few proves the rectitude and enthusiasm of a large number of men, but for some time it has been known that a more efficacious and orderly scheme, one less dependent upon personal sacrifice, must be found to supplement the clinical education of the student. The scheme is designed to correct defects that have arisen in the system as science has progressed.

It may be mentioned that the idea of clinical units was suggested by the late Sir William Osler and Mr. Abraham Flexner. It is likewise worthy of notice that in each of the five schools which have established clinical units special room and laboratories have been allocated or are to be constructed for research, and the assistant directors, as well as the directors, will have opportunities for investigating patients under their own charge as inpatients. In every case it is proposed eventually to institute research studentships, so that promising juniors may be trained after qualification in the methods of research. The arrangements for research will vary with the individual bias of the investigators and moreover, will have no direct connection with the undergraduate, except in so far as he is being taught by men who are keenly alive to the importance of discovering a scientific basis for medical practice. It would appear that for all concerned the institution of clinical units signifies the simplification of medical training, as well as tending to great thoroughness and general efficiency. It is well to know that medical education here is not at a standstill or marking time, but is striding forward in keeping with the trend of modern medicine and surgery.

Editorial Notes and Comments

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THE THERAPEUTIC IMPORTANCE OF PSYCHOLOGY.

The importance of psychology as a science and its value in medicine is more and more in evidence as time goes on. It is not so long ago that the views of Freud, who taught that the unconscious mind is released into activity from the shackles that the conscious mind puts into it only during sleep, were condemned and despised. Although the teachings of the Viennese professor are not accepted by all, the basic principles of his theory are now generally agreed to. This was shown at the meeting of the British Association for the Advancement of Science held recently in Cardiff, Wales, where in the section devoted to psychology five papers out of every six read revealed the influence of Freud.

Another branch of psychology which is rapidly coming to the fore is that of industrial psychology. However, to return to the matter of investigating the unconscious, it may be said that an excellent paper was read at Cardiff by Dr. C. W. Kimmins dealing with the dreams of children who are physically abnormal. The speaker pointed out that the great value of the dream of the neurotic in the diagnosis of cases of mental disturbances had been proved beyond all dispute in the treatment of war neurosis and a great variety of nervous ailments. On the other hand, the dream of the normal healthy child also appeared to him to open up a very useful field for research as being the best method of investigating the unconscious which played such an important part in human behavior.

At the title denoted, the paper by Kimmins was taken up with the investigation of the dreams of physically abnormal children. Dealing with an investigation of the dreams of five hundred physically defective children, blind and deaf but not suffering from mental defects, he said that the dreams of the physically defective differed from those of the normal in the following way: 1. First, they dream far less about food, from which it would appear that the crippled child is better fed than the normal child. 2. Among the fears, a larger proportion dream of accidents, and the fear of animals is clearly greater than among normal children. 3. The kinesthetic or falling dreams are more common, especially at the ages of thirteen and fourteen years. 4. Among the fulfilled wishes, visits to the country bulk very largely. 5. The death element in the dream occurs more frequently than is the case in normal children, and more even than in the dreams of the deaf and blind.

Kimmins analyzed and discussed the subject at length and concluded that from an educational point of view there was in the dream a valuable and fascinating field for research and that a further study of the dreams of children who were physically abnormal might clear the way to a fuller understanding of the significance of the dreams of normal children. A careful study of children's dreams might throw much light on the study interests and desires of the child at different ages and especially where persistent dreams were recorded of unfulfilled wishes or those elements which were conspicuously lacking in the life of the child, and which might seriously interfere with his natural development. From various sources there comes a mass of evidence as to the great influence the unconscious exerts in every department of mental activity, and a fuller knowledge of the unconscious might be as essential in dealing with the normal development of children as in the abnormal cases in which it has proved to be of such extraordinary value.

The veteran anthropologist, Karl Pearson, at the same meeting also paid his respects to psychology, saying that a good knowledge and practice of the science were of the utmost use in all phases of human endeavor and especially so to the State and to industry. He even went so far as to affirm his belief that the war might possibly have been prevented and certainly many of its horrors assuaged if properly directed psychology had been allowed free sway. That psychology is of great therapeutic value in the diagnosis and treatment of certain complaints is now a matter of common knowledge.

PHYSICIAN-AUTHORS—GEORGES B. E. CLEMENCEAU.

Everybody, of course, knows Georges Benjamin Eugene Clemenceau, France's Grand Old Man, for his fame was so recently at its high tide. Destiny cast him for an heroic rôle on the grand stage of life, the rôle of statesman at an hour when his country needed all the genius of statecraft he could bring to bear on the situation. It is in that rôle that we know him, but he has played other rôles in his time and played them well. The chief of these minor activities were as a physician and as a writer. He became a physician through the influences of heredity and parental suggestion; for three hundred years without a break his forbears had been physicians; and he became an author through a temporary eclipse of his political fortunes.

Clemenceau's career as a physician was brief, but notable and unique. Doubtless the troubled political conditions in France at the time served to cut it short. He was a republican, and the Second Empire was at the height of its fame and influence when he studied medicine in Paris. His father had been a leader of radical republicans in the picturesque Biscayan village of Mouilleron-en-Pareds, where Clemenceau was born (in 1841), and imparted to the son those strong democratic tendencies which have been the outstanding characteristic of his political career. Naturally, then, he was a bitter foe of the Empire. Before he was twenty-five years old he was imprisoned for shouting *Vive la République!* at an Imperial celebration. He served his term and then, practically in exile, came to New York. This was in 1866, within a year after he had received his medical degree. As a student he had shown marked medical aptitude and his thesis, *The Generation of Anatomical Elements*, written at his graduation, was acclaimed the ablest paper published by the Faculty of Medicine that year. This gave him great advantages, but he ignored them and established himself in the Montmartre section, where he began treating patients gratuitously and expounding republican doctrines to them. It was from this practice that he was driven by the semivoluntary exile.

In New York Clemenceau tried to build up a practice but failed, and so went to Stamford, Conn., where he taught French in a girls' school. It was in America he did his first writing, letters to *Le Temps* of Paris on social and political conditions here, and at Stamford he translated John Stuart Mill into French. Early in 1870 he returned to Paris and resumed his Montmartre practice. Then came the disastrous Franco-Prussian war and the collapse of the Second Empire. His dream had

been realized and destiny had launched him fairly on his political career. In a short time he was weaned wholly away from medicine, coupling journalism with politics to increase his power. He had a ready pen and a bitter one, and it was at this period that his ability to upset cabinets earned him the name of the Tiger. In 1880 he founded and edited *La Justice*, a daily, and wrote about anything and everything, but mainly about politics. This periodical was suspended three years later when Clemenceau fell from political eminence with astonishing suddenness, due to charges in connection with the Panama Canal scandal. Although he met every charge, his constituency turned solidly against him and for nine years he had no connection with the government of France. Immediately he became a man of letters and during the nine years wrote one novel, two volumes of tales and sketches, a volume of sociology, a play with scenes laid at the court of China, a quantity of ordinary journalism including articles on the Dreyfus case which make four fat volumes, and several other books. His best known work is the volume of essays, *Great Pan*, which critics assure us is replete with ironic grace and humor and a delicate classical spirit. Episodes that grew out of his experience as a physician are contained in the two volumes of tales, and these are said to be his best fiction, grimly picturesque, clear cut and full of realism. His novel, *The Strongest*, a severe criticism of social life, was a dull and tedious failure. Recently it was published in translation in America, not because of its merit but because of widespread interest in the author.

When the Dreyfus case developed Clemenceau founded *L'Aurore*, devoted to proving Dreyfus innocent. It was in *L'Aurore* that Zola published his famous *J'Accuse*. No less a critic than Sidney Brooks has said that Clemenceau's Dreyfus articles are "the most brilliant masterpieces of polemics that French literature has produced since Pascal's familiar *Provincial Letters*." It was these articles that restored him to that political power which culminated in the premiership.

What may perhaps be Clemenceau's last volume is a book entitled *France Facing Germany*, a collection of speeches and articles on the origin of the World War and the progress of hostilities—a volume that doubtless will be of great historical value in future years. In style Clemenceau's writings are fluent and vivid always, an admirable byproduct that serve to show the almost limitless capacities of a very remarkable man.

At present, Clemenceau is again somewhat in eclipse because of dissatisfaction with the peace-making and nearly all French newspapers are re-

viling him and accusing him either of incompetence or treachery. Only a few months ago he came near being President of France. Several journals have urged him to take up the pen again in his defense, but the old statesman has declined and his decision appears irrevocable. He is seventy-nine and his fame is secure. He can afford to regard it all as a sardonic joke.

ERYSIPELAS IN ELDERLY SUBJECTS.

Of all the local complications of erysipelas in elderly people suppuration is the most frequent, arising in the phlyctenæ—rare in old subjects—or in the cellular tissue underlying the dermatitis, preferably where it is loose. They are due to the streptococcus alone and not to an association with the staphylococcus. Suppurating erysipelas is also observed, while gangrene of the limbs and scrotum has been met with, especially in cachectic, diabetic, and renal subjects. An acute angina at the onset of erysipelas, suppurating otitis media, and lesions of the ocular and nasal mucosa are very common. In thirty cases of erysipelas in old people, Lamy met with a mild catarrhal conjunctivitis and once a conjunctivitis with dacryocystitis; both were bilateral. The streptococcus was found in pure culture, but the conjunctiva and ocular globe did not become involved.

The most frequent local complication, according to Lamy, is sclerosis of the derma of the face, a sequela of the streptococcal dermatitis. The thickening of the derma is accompanied by redness over the site of the erysipelas that has disappeared and may lead one to suspect a return of the process, but the absence of local hyperthermia is the best sign that such is not the case. This hard edema is more frequent in the lower limbs and face and is more prone to occur in relapsing erysipelas. Bendix, Dupouy, and others have shown that in the face the lesion is a pachydermic change without any inflammatory process, and in the area of the sclerous dermatitis the lymph does not contain the streptococcus.

In Lamy's cases this special type of scleroderma was accompanied by a cutaneous vasodilatation which gave rise to the redness of the skin. The frequency of infectious erythemata during and following the various infectious processes are well known, this frequency being due to the very marked action of the microbic toxins on the vasomotor centres. The toxins stimulate the vasodilators so that they react with the greatest facility and the redness remaining after erysipelas is a manifestation of this action. These vasomotor disturbances may awaken a latent eczema or cause an outburst of syphilides in old syphilitics.

The general complications during erysipelas in the aged are regarded as common by most observers, and death is frequent, although it is due not to a streptococcal infection but rather to the insufficiency of some viscus. The early or initial pulmonary congestion often observed should be looked upon as a symptom of erysipelas and not as a complication. Enriquez and others believe that renal complications are frequent in erysipelas in old people but Lamy never met with any.

Besides the true visceral complications, visceral disturbances with a favorable prognosis are also met with, according to Lucien and Parisot. According to these observers renal, hepatic and cardiac complications arise in organs previously the seat of lesions. Streptococcal endocarditis, pericarditis and pleural empyema have been observed as complications of erysipelas in the aged. Pneumonia and pulmonary congestion have also been described. The pneumonia of erysipelas has a rapid evolution, a vague symptomatology, and a fatal issue, and to detect it at its onset the thorax should be given a daily auscultation, otherwise the lung process may not be recognized.

Delirium is a common complication of all infectious processes in elderly people and often afterward the first symptoms of senile dementia arise.

Of the abnormal types of erysipelas in the aged may be mentioned the bilious and adynamic forms, although they are uncommon. Recurring erysipelas is far more fatal in elderly subjects than in adults because their systems are less resistant. A progressive attenuation of the specific dermatitis may be observed in them and each recurrence reveals a growing opposition between general immunity and the local predisposition, both increasing after the previous attack.

SPIRITS AND SCIENCE.

Suppose a violent shaking of the earth amid an accustomed peaceful scene. In its train will be found cast up fossils, relics of a time so long forgotten that these objects appear to the inhabitants of the green earth utterly strange and new. They do not belong to the familiar soil. Their origin must have been some unknown land from which they have intruded upon the view. Such an earthquake, in greater or smaller proportions, occurs at every crisis in individual life or in that of nations. At such time intruders seem to make themselves felt, apparently unfamiliar and so attributable to almost any external agency. Is it strange that in the psychic upheavals of the past six years there has been a strong revival of belief in such presences,

intruding in daily affairs or more softly coming to visit their own living ones?

One of the world's keenest modern psychologists explains on the basis of such cataclysmic disturbances this present day revival of the really never extinct belief in spirits. In a timely address before the Society for Psychical Research in England, Jung¹ presents scientific facts to explain that inner psychic experiences give origin to such belief in spirits. He does not deny "that mystic and supernatural something which alone makes a man a man." He shows how man could create this, however, out of his own buried psychic life. Thus man preserves something about himself which has ever recurred in one form or another to preserve him from a demoralizing materialism. Man's perception of the natural world around him, as well as of his inner psychic activity, has always remained the same. His interpretation of it has varied with time and with change in intellectual viewpoint. Particularly in more primitive times man has been more prone to interpret the things he perceived arising from his inner psychic realm as ghosts coming to him from without. Later he has weakened this conception by calling them merely dreams or morbid symptoms, without even consideration enough for them to stop to inquire their significance. They were still foreign to his external thought, which he was inclined to think was all there was of his mental activity. Yet under special stress they might take on for him the appearance of objective reality.

Now, however, science has laid its hand on the dream, the apparition, the neurotic imagining. Each one yields itself as a product of the mental life but lying so deep, sometimes so separated from the ego's realization of itself that when it appears it has the force of a foreign intruder. Jung likes to describe the unconscious as separated into two parts. He names first an individual unconscious made up of experiences which have been repressed below consciousness within the individual's own life. These are not felt as foreign to the ego when they are again brought into its ken, as through the process of analysis. But there is also a larger unconscious, which he calls a superpersonal or collective unconscious, meaning thereby the "congenital instincts and primordial forms of apprehension" which belong not to individual experience but which appertain to the whole of mankind. These appear to consciousness as foreign, adverse. Traces of such archaic images appear in dreams and in more disturbing form in certain cases of mental derangement, chiefly in dementia præcox.

There are, and always have been, people of more than the usual range of intuitive perception. They have been able to grasp more than others of this larger unconscious and translate it over into new ideas. These may be acceptable, answering perhaps to an unconscious preparation which has tended toward their acceptance. They may prove unacceptable and conflict too violently with what has long been held true. In either case there occurs a change in conscious thought and in consequent activity, which on such grounds needs no explanation of extrahuman intervention but has its origin only in the larger human life of the past as well as of the present. The appearance of departed spirits rests upon the same psychic mechanism. Furthermore, the amount of psychic energy attached to a loved one is applied, when the object is removed by death, to the mere image or idea of that object. This attachment of energy to an image may so separate this portion of psychic energy from the personal ego that the image attains the force of a separate existence. The loss of this energy may even be felt to such an extent that the spirit itself is accounted an injurious presence.

Jung makes no arrogant assertions which deny the possible independent existence of actual spirits. His familiarity, however, with the content and the mechanisms of the unconscious gives weight to this scientific basis for the spiritual phenomena which have always been present in man's speculation. It should help to steady intellectual thought in these days when spirits of many sorts have been roused from their psychic hiding places.

NEEDLESSLY BLIND.

The days when workmen were seriously injured and incapacitated for work through no fault of their own are rapidly coming to an end. Formerly a small compensation or tiny pension calmed the employer's conscience; now the law is standing outside the door and none may keep her from the discussion of how much shall be paid. The employer's one loophole is contributory negligence, and this happens very frequently, for, to the employee, it seems waste of time to take precautions against an evil he has never had to face and which, to his knowledge, has never happened where he works. So the National Committee for the Prevention of Blindness has to state that out of the one hundred thousand blind in the United States more than fifty per cent. are needlessly so. The national council estimates there are two hundred thousand eye injuries in our land and the International Association of Labor Legislation has issued a list of fifty-six industrial poisons of which thirty-six affect the eyes. Men repeatedly disobey the foreman and neglect to wear the goggles provided. They complain they are heavy, disagreeable to wear, and some-

¹ C. C. Jung, *The Psychological Foundation of Belief in Spirits*, Proceedings of the Society for Psychical Research. Part LXXXIX, Vol. XXXI.

times become cloudy. The providing of individual goggles, insistence on their being worn, removal of dangerous vapors and gases and properly ventilated and lighted rooms, ought to remove all objections, but many times when the employer is honestly doing his best, the employees behave like children. Practically all California's eye injuries are caused by flying objects, small pieces of steel or emery dust. The injured one's plea was that he only had to do one minute's grinding at the emery wheel and did not wear goggles as he thought nothing could happen in that time. Stodgy ignorance, willful or pardonable, is one of the slowest but most vicious devils the medical profession has to encounter.

News Items.

Smallpox in Scotland.—To date 474 cases of smallpox have been reported in the Glasgow district. Vaccination is stated to be falling off.

New Philadelphia Hospital.—A new hospital to be known as the Robert H. Crozer Hospital will be erected on the grounds of the Chester Hospital, Philadelphia, and deeded to that institution for ninety-nine years.

State Institution Leased by Government.—The United States Government has leased the former state home for inebriates at Knoxville, Iowa, and will remodel it as a hospital for former service men in the Middle West.

Course in Sex Education.—Announcement has been made by the University of Cincinnati of a new course dealing with sex education. The subject will be presented from the sociological and psychological as well as the biological viewpoint.

Walter Reed Hospital Work Filmed.—A film showing the work at the Walter Reed Hospital, Washington, for wounded soldiers, from a physical, educational and recreational viewpoint, will soon be exhibited through the efforts of the Potomac division of the American Red Cross Society.

Neurological Society Meets.—A stated meeting of the New York Neurological Society will be held on October 5th. Papers will be presented by Dr. Junius W. Stephenson on Clinical Studies of Syphilis of the Central Nervous System and by Hannah M. Creasey on Stuttering: Etiology and Therapy.

Proposed Memorial to Major General Gorgas.—An international institute for the study of tropical diseases, to be established in Panama, has been proposed as a memorial to the late Major General William C. Gorgas. It has been stated that the government of Panama is willing to donate the St. Thomas hospital for the use of the institute.

Akron's Twins.—Akron, Ohio, is having an epidemic of twins, according to a press dispatch quoting figures at the Bureau of Vital Statistics. Akron lays claim to the largest proportion of twins to other births of any city in the union. In 1919 forty-six pairs of twins were born, and forty-one pairs have already been born up to August 31st of this year. Of the 1920 twins, sixteen pairs are male, twelve female, and thirteen mixed.

Safety Congress.—The ninth annual safety congress of the National Safety Council will be held September 27th to October 1st in Milwaukee.

Red Cross Magazine Discontinued.—The *Red Cross Magazine* will suspend publication with the October issue, on account of the increased cost of paper and publication.

University of Sydney.—Dr. J. T. Wilson has been elected dean of the medical faculty of the University of Sydney, Australia, succeeding the late Sir Thomas Anderson Stuart.

Battleship Laboratories.—The British Ministry of Agriculture is arranging to employ obsolete battleships as floating laboratories for the investigation of foot and mouth disease.

Chair of Pharmacology.—The University of Sheffield, England, has established a whole time chair of pharmacology to which Dr. Edward Mellanby, at present professor of physiology in the University of London, has been appointed.

Increase in German Women Students.—Reports from Germany state that there are at present approximately 8,000 women studying in German universities, twice the number registered five years ago. Of these, more than 2,000 are medical students.

Queen's Medical College.—Dr. Lorimer J. Austin, of London, has been appointed professor of clinical surgery and Dr. James Miller, of the University of Edinburgh, has been appointed professor of pathology in Queen's Medical College, Kingston, Ont.

French Orthopedic Congress.—The second French Orthopedic Congress, will be held October 8th and 9th in Paris. The questions to be considered are: Treatment of scoliosis by Abbott's method; ischemic retraction of Volkmann; treatment of paralysis by tendinous anastomosis.

Redard Prize.—A fund yielding an income which is to be awarded as a 5,000 franc prize every fifth year for the best work on orthopedic surgery, has been bequeathed to the Académie de médecine, by Dr. P. Redard, a prominent French orthopedic surgeon. Physicians of all countries and interns in Paris hospitals may compete.

Meeting of Colored Physicians.—The National Medical Association of Negro Physicians, Surgeons, Dentists and Pharmacists held its annual meeting August 25th to 27th in Atlanta, Ga., under the presidency of John P. Turner, of Atlanta. Dr. Henry M. Green, of Knoxville, Tenn., was elected president and Louisville, Ky., was selected as the next place of meeting.

Classification of Paris Professors.—Professors in the Paris Faculty of Medicine are said to have been placed in two categories according to their seniority, receiving, respectively, twenty-five and and twenty-three thousand francs yearly. Professors Richet, Pouchet, Hutinel, De Lapersonne, Gilbert, Roger, Nicolas Ribemont-Dessaignes, Quénu, Prénant, Widal, Chauffard, and Weiss have been put in the first class, and Professors Delbet, Marfan, Hartmann, Bar, Marie, Broca, Teissier, Desgrés, Lejars, Achard, Robin Legueu, Letulle, Couvelaire, Carnot, Besançon, Vaquez, Dupré and Jeanselme in the second class.

Sixth International Surgical Congress.—It has been decided by the recent Paris conference that the sixth congress of the International Surgical Association will be held in London in 1923, under the presidency of Professor MacEwen, of Glasgow.

Funds for Broad Street Hospital.—In view of the splendid work done by the Broad Street Hospital, New York, during the Wall Street explosion of September 16th, a movement is under way in the financial district to solicit funds for this institution. It was revealed that the quarters and staff of the hospital are too small for such emergencies.

Immigrants to Be Vaccinated.—Orders for the vaccination of all third class passengers leaving European ports for this country have been issued to United States Public Health Service surgeons in Europe by Dr. Rupert Blue, formerly surgeon general of the Service. The precaution has been taken to prevent the spread of smallpox from Central Europe. Dr. Blue has also announced that more health officers are soon to be sent abroad; at present there are ten in Europe.

State Drug Clinics Close.—All clinics established by the New York State Narcotic Drug Control Commission in sixteen cities have been ordered closed, following the refusal of hospitals to receive drug addicts to complete their cures. Commissioner Walter R. Herrick plans to ask the next legislature to appropriate funds for the construction of at least three state hospitals for drug users, one in New York, one in the northern part of the state, and the third in the western part.

Personal.—Assistant Surgeon W. C. Rucker, of the United States Public Health Service, has been appointed chief quarantine officer at Balboa, Canal Zone, relieving Surgeon S. B. Grubbs.

Dr. Oscar Davis, of Anderson, has been appointed state health officer of Texas, succeeding Dr. Charles W. Goddard. Dr. Goddard has resigned to become chief of the medical staff of the University of Texas, Galveston.

Professor Frank G. Haughwout, head of the department of parasitology in the University of the Philippines, has been appointed protozoologist in the Bureau of Science, Manila.

Canadian Medical Association.—The fifty-first annual meeting of the Canadian Medical Association was held June 22nd to 25th at Vancouver, with over one hundred medical men from the United States in attendance. Dr. Murdoch Chisholm, of Halifax, was elected president. It was decided to hold the next meeting in Halifax. Among the important items of business considered were the general reorganization of the association on a more businesslike basis, the proposal to form a Canadian College of Physicians and Surgeons, the organization of the profession in its relation to the Workmen's Compensation Act, and the making of certain changes in the size and appearance of the *Canadian Medical Association Journal*. The following committee was appointed to consider the formation of a Canadian College of Physicians and Surgeons: Dr. H. A. MacCullum, of London; Dr. S. E. Moore, of Regina; Dr. F. W. Marlow, of Toronto; Dr. A. E. Garrow, of Montreal; Dr. James McKenty, of Winnipeg.

New Hospitals in China.—The *China Medical Journal* records the opening of several new hospitals in China. The Chinese Infectious Diseases Hospital in Shanghai and a new quarantine hospital at Newchwang were both opened in July. The Summer Diseases Hospital in Shanghai was opened in June.

University of Toronto Senate.—Dr. Augusta Stowe-Gullen, Dr. Charles J. C. O. Hastings, Dr. Arthur C. Hendrick, and Dr. Andrew S. Moorhead, all of Toronto, have been elected medical representatives to the senate of the University of Toronto.

Michigan Takes Tuberculosis Clinics.—The tuberculous clinics formerly supervised by the state antituberculous association have been taken over by the Michigan Department of Health, which will conduct clinics throughout the state. Dr. George H. Ramsey, formerly director of the tuberculosis pavilion in the Herman Kiefer Hospital, Detroit, will have charge of the examination of patients for tuberculosis, while under the direction of Dr. Frank L. Rose, of Jackson, children will be examined for pretuberculosis defects. The work will be under the supervision of the division of communicable diseases of the State Health Department.

Infant Mortality Report.—A statistical report of infant mortality in 269 cities of the United States has been published by the American Child Hygiene Association. The report lists the following cities with low infant mortality rates under the caption—Where Babies Have the Best Chance: Brookline, Mass., 40; Berkeley, Cal., 44; Marinette, Wis., 45; Aberdeen, Wash., 45; Everett, Mass., 47; Madison, Wis., 47; Piqua, Ohio, 48; Alameda, Cal., 49. The infant mortality rate for New York City is given at 82. Cities with particularly high infant mortality rates are: Pittsburgh, 115; Buffalo, 107; Kansas City, Mo., 103; New Bedford, Mass., 124; Camden, N. J., 121; Nashville, Tenn., 116; El Paso, 245; Knoxville, Tenn., 135; Racine, Wis., 123; Burlington, Vt., 150; Paducah, Ky., 146; Hannibal, Mo., 145.

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Died.

BAER.—In Philadelphia, Pa., on Saturday, September 11th, Dr. Benjamin F. Baer, aged seventy-four years.

BOOKER.—In Selma, Cal., on Friday, August 20th, Dr. Thomas A. Booker, aged forty-eight years.

BULLWINKLE.—In Brooklyn, N. Y., on Tuesday, September 14th, Dr. Henry Bullwinkle, aged fifty-four years.

COTTER.—In Brooklyn, N. Y., on Wednesday, September 15th, Dr. John Henry Cotter, aged fifty-two years.

GIBSON.—In Ramsey, N. J., on Thursday, September 16th, Dr. James T. Gibson, aged sixty-four years.

DRUM.—In Syracuse, N. Y., on Saturday, August 28th, Dr. James Henry Drum, aged fifty-one years.

GREGORY.—In Stroudsburg, Pa., on Thursday, September 9th, Dr. William Edwin Gregory, aged sixty-seven years.

HOLLAND.—In Winnipeg, Can., Dr. Robert A. Holland, of Calais, Me., aged fifty years.

JUDGE.—In Philadelphia, Pa., on Thursday, September 9th, Dr. Robert B. Judge, aged sixty-three years.

LUXFORD.—In Princess Anne, Va., on Thursday, September 9th, Dr. Thomas B. Luxford, aged forty-nine years.

MILLER.—In Omaha, Neb., Dr. George F. Miller, aged eighty-nine years.

STEARNS.—In Port Alleghany, Pa., on Tuesday, September 7th, Dr. John S. Stearns, aged seventy-two years.

Book Reviews

TREATMENT OF NEUROSES.

Treatment of the Neuroses. By ERNEST JONES, M.D. (Lond.), M. R. C. P. (Lond.), President of the British Psychoanalytical Society; Member (for England and America) of the Council of the International Congress for Medical Psychology and Psychotherapy; Honorary Member of the American Psychopathological Association. New York: William Wood & Co., 1920. Pp. viii-233.

More progress has been made in the treatment of the neuroses than in any other branch of medicine, and among the most progressive of the workers in this branch of medicine is Dr. Ernest Jones. The book which he presents on the treatment of the neuroses is an elaboration of the section devoted to this subject in Jelliffe and White's *Modern Treatment of Nervous and Mental Diseases*.

One of the interesting features of Jones's book is his tolerance toward other more obsolete methods of treatment. He traces step by step the important measures that have replaced other methods in the evolutionary progress that has been made in this branch of medicine. He first considers, in a broad way, the handling of hysterical subjects, analyzing the various physiological means that have been used. The Weir Mitchell treatment is described in detail. The author then takes up the various psychological methods and divides them into three principal divisions, viz., suggestion, reeducation, and psychoanalysis. Under suggestion he places various types of hypnotism. In an exceedingly simple manner he shows the mechanism underlying these processes and how they fall short of the ultimate aim.

The chapter on reeducation is more complete. This method of treatment, while it shows much progress over the methods previously used, still does not suffice. A deeper search is made for the pathogenic factors in place of being content with dealing with the results of the pathological condition. Therefore from the point of view of stability this system is superior to that of suggestion. In searching for causative factors it was found necessary to go beneath the surface. The reactions of the patients are not due to the stimuli which are seen on the surface but to traumatic shocks received at other periods of the patient's life and the emotional reactions are caused by the present stimulus bringing back the former effects, which may be forgotten by the patient, but which continue to exist in his unconscious and retain their vitality in an amazing manner.

Finally psychoanalysis, the method devised by Freud, is discussed. The method which was first intended for the treatment of hysteria has been put to wider application and at present is successfully used in many other forms of psychoneuroses. Fundamental problems of psychology have undergone revision and the fields of mythology, folklore, philology, and anthropology have been examined by this new science.

Nevertheless it has remained the treatment of choice among progressive neurologists for hysteria and similar neuroses. The findings of reeducational methods are in the main confirmed by Freud. It is granted that every hysterical symptom has for its basis an amnesia. It is acknowledged that the un-

conscious functioning of unconscious material is an important factor in the theory, but Freud does not emphasize the factor of a vague constitutional inferiority as being a secondary factor. The inability of the patient to make adjustments to his surroundings due to his inability to orient himself to the situation as it exists in his own unconscious is largely responsible for the disordered state.

Jones shows how psychoanalysis is the method of choice as it is the most thorough method of all. He carefully explains the technic of transference, the analysis of the dream, and other unconscious material, how use is made of free association in tracing back complexes, and how the patient gradually becomes acquainted with himself by the unraveling of his unconscious which has been hidden from him and yet has created the havoc which led to the neuroses.

Some space is also devoted to the anxiety neuroses, anxiety hysteria, neurasthenia, obsessions, hypochondria, and the traumatic neuroses. Other topics of a forensic nature are also discussed.

The book is extremely well written and unlike many books on neurological subjects it does not run away from the practitioner by the use of highly technical phrases. Dr. Jones has been careful to keep it within the reach of everyone who would be likely to read the book and at the same time he has not in any way lost the import of any of the material presented. It is seldom that one can say in speaking of a medical text book that it may be read and enjoyed.

GOTTFRIED KELLER.

Gottfried Keller. Psychoanalyse des Dichters Seiner Gestalten und Motive. Von Dr. EDUARD HITSCHMANN. Wien, Austria: Internationaler Psychoanalytischer Verlag, G. M. B. H., 1919. Pp. vii-125.

Poets afford a peculiarly instructive study of what man is and why he is hindered in being more than he is. Poets are poets in that they are compelled from within to reveal what constitutes a human life, with its limitations. Psychoanalysis turns fearless eyes upon these inner things and a sympathetic ear to these self-revealing voices. Through a psychoanalytical study of the poets, therefore, knowledge is gained which has a manifold value, the poet himself is better understood and comes closer into the common brotherhood of striving and divided success. His message is fraught with more universal meaning. The limitations which mark his work, which often are but the warring of elements of greatness and power, are the wholesome lessons directed upon all lives. Especially in the spirit of today they call for an invigorating search into our own lives to understand our failures, to find only in some other form the same inner psychic causes for limitation and imperfection everywhere. In this way they act as reproachful stimuli to a better guidance of child nature than the race has yet deemed worth while.

It is this last consideration which is urgently forced upon one from the psychoanalytical study of Gottfried Keller, poet and artist, and a striking figure in German literature. For he had greatness

and the limitation which his fundamental childish fixations put upon him were in themselves largely the starting point, after a good deal of delay, of the forms his creative activity made its own. Yet his work was so much less freely expressive than it might have been, the imprint of his personal conflicts was so great, his personal life fell so far short of that of the healthy man, that one is almost oppressed with the sense of burdening waste which a bad early adjustment can work in any life. On the other hand, one is heartened by the innate resoluteness of the human psyche which turns to an expression which, more or less successfully, frees the burden in the poet and in those to whom he speaks.

It is not an idle surmise, this discovery of the source of incompleteness in artistic power and of failure in life in Keller's early years. He has given testimony in his own reminiscences, though he was a silent, reserved man, as well as in his manner of life. His works, particularly his *Grüner Heinrich*, are autobiographical, not so much of external events as of the attitudes and inner experiences which they contain. So also are the years of groping after his work and the final slow development of it. Something prevented him from devoting his life to painting the human figure, and landscape painting passed over into word painting and the deeper development of epic writing.

This history, with its close reference to the psychic life of Gottfried Keller, is sketched in this attractive volume of Hirschmann. One by one the various infantile elements are revealed as playing a conspicuous part in his life and his work. It would seem that Hirschmann might have entered somewhat more enthusiastically into his subject and carried his readers more completely into the poet's psychic experience. Perhaps this is due in part to a lack of familiarity with his works on the part of the English reader such as Hirschmann may presuppose with his readers nearer home. The book, in spite of its slightly sketchy character, forms a welcome addition to the growing number of psychoanalytical studies of our creative writers. It reveals as such that knowledge of human life which is needed more and yet more and it stimulates to a use of such knowledge. Thus failure may be prevented and success increased.

A MODERN DON QUIXOTE.

*Youth and Egotism.** By PIO BAROJA. Translated from the Spanish by JACOB S. FASSETT, JR., and FRANCES L. PHILLIPS. Edited with Introduction by H. L. MENCKEN. New York: Alfred A. Knopf, 1920. Pp. v-265.

A most refreshing book. It is rather difficult to agree with a man like Baroja who disagrees with almost everybody and everything but at least he is to be admired for his candor. He deals, in this small volume, with all manner of things and most fearlessly. Politics, literature, art, religion, and men are all inspected by the gaze of this vigorous Basque. Basque he is and physician and baker he was, but through it all he has remained a rebel. In his analysis, if such it may be called, he uses an acid that bites deeply, but no matter how far-reaching his deductions one feels that he is sincerely searching for the truth: He loathes the complacent bourgeois, with their self-satisfaction and

their tolerance of orders and things they know nothing about. He hates bitterly all of the instrumentalities that help keep people in darkness. He feels that they are his enemies, for they are the enemies of progress.

He has a few literary favorites, including our own Poe. With Dostoevsky and Nietzsche he finds no fault, but few others are immune from his withering criticism. Shakespeare, Molière, Cervantes, are all flayed. Then he attacks Goethe, Hugo, Chateaubriand, Stendhal and Balzac and in truth it must be told he finds their weaknesses with precision. He is daring in his attacks and with a few acrid words closes the incident. For the critic he finds little praise and so he burns his way through, respecting little but striving to maintain his own self-respect. It is a small book but it would be difficult to fall asleep reading it. Of great interest to us is the fact that at one time he was a physician. This, however, should not account for his bitterness, for they do not all get that way.

BREAKERS AHEAD.

Feminism and Sex Extinction. By ARABELLA KENEALY, L. R. C. P. (Dublin). New York: E. P. Dutton & Co., 1920. Pp. vii-313.

Arabella Kenealy draws three vivid pictures: What woman was, what woman is, and what she will become. Two fates await her, feminism and feministicism, unless she rids herself of a contempt for functions and duties purely hers. Moreover, she is handicapped every month for two or three days by a certain amount of weakness and pain, and every man knows her temper is affected at such times. Many months are consumed in childbearing, and still more months in childrearing. It is no use quoting the rude health of savages. Mrs. Savage has not to clothe her offspring; nor have a washing day, nor go shopping. The modern woman can get all sorts of appliances for lessening the care of children, but no one has yet borne an automatic baby whose crying could be turned off and sleep turned on. "The hand that rocks the cradle rules the world." Well, she may have an automatic hand to do the rocking, but the psychologists have already condemned rocking as an evil practice. Girls can refuse to have babies. The law can exert no compulsion, but that would result in extinction of the civilized stock and domination by savage tribes. This craze to do man's work will end in the emasculation of men. This desire to figure in the senate "far from stiffening the manly calibre of weak men in it will still further enervate them. Women should have a house of their own, wherein to foster the interests of women and children mainly." Members of either sex are not capable of doing their best work while in association with the other. Sex rivalries are stirred, sex ascendancy engendered. Besides, man inherits from his mother the quatum of "woman apprehension, foresight and altruism required to present the woman's bent and viewpoint. More of it would be superfluous." The author thinks the huge numerical preponderance of women must presently swamp masculine initiative in state affairs, unless the political functions of the sexes are separated.

Also that women are swiftly coming up abreast of men and threaten to outdistance them, but the emotions and devotions, purity, sweetness, patience, forbearance, loveableness, courtesies and graces have fallen out of culture. The yielding by man to the other sex of masculine essential rights and obligations is a symptom of declining virility, physical and mental. So far the author does not draw flattering pictures. Here is one which may arouse wholesome alarm:

One serious aspect of feminism is that woman in gaining mannishness is losing beauty. The faces even of our handsomest women are preeminently bold, sophisticated, clever without sweetness. The eyes are cold and critical and challenging. The naturally delicate contours of chin and cheek have deteriorated to the crude and heavy lower jaws of those desexed by masculinity. Our schoolgirls and workgirls are, biologically speaking, spoiled copies of men. The neuter state shows in the faces of many women. In the eyes of young women of strenuous pursuits the characteristic sterile glint, part boldness, part antagonism, is common.

But how about the ultrafeminine who plunge in violent recoil into social frivolities, vanities, dissipations, pranks, intrigues, excesses? Two extreme camps are being formed, the mannish and strenuous and the overfeminized and purposeless, more or less idle and frivolous, selfishly absorbed in clothes, in luxury and pleasure; exacting masculine tribute in mind and kind, and since every privilege is shared by both sides—liberty, latchkeys and general latitude. Between the two extremes stand the natural, noble and invaluable moderates, normal women content to be normal women and to fulfil the destined rôle of such. Man, however, seems to prefer the feminist.

There are other evils growing. Our school and college girls make heroes of their own sex who excel in manly sports, they worship the man in them; also strong attachments between the sexes, man for man, woman for woman, are intensifying. Women are attracted by mannish traits in their sex, men by effeminate men who possess feminine traits of sympathy and sentiment. Both sexes are lapsing towards a neuterdom, evidence of sex decline. The present day decline in parental impulse and affection shows it. To quote Havelock Ellis: "These weak chinned, neurotic young men are no match at all for the heavy jawed resolute young women feminist methods are creating. The yielding to women of masculine rights is a symptom of declining virility. Equality in all things yielded, pride in himself, in his work, gone, he will descend to the state of the decadent savage who keeps as many wives to work for him as their work for him enables him to keep."

Moreover, overworked woman may impair the constitutional vigor of man, while she works with him. She is kept up by nervous excitement, by strong tea or drugs. In short, woman is fussy. In a stress of work she will work on with crimson cheeks and growing irritation, while man will put on his hat and calmly resort to the nearest lunch room. Women by their eternal high pressure as heads of departments are making nervous wrecks

of the men. "Nervous depletion caused by working wives has doubtless much to do with the inanition and depression now crippling our industrial output."

Can the man keep his chivalry and meet the woman on equal terms? He will still see her as mother, wife or love (mistress). He cannot disregard her involuntary looking to him for aid. How it will be when men realize what feminism means we cannot tell. Women's abnormal mentality added to their impulsiveness impels them to break loose from those bonds of affection, tradition and aspiration which are their safeguards. Power, which steadies all but weak men, too often drives women to destruction.

So far we have quoted the author in giving her fears for the future. What does she want? She would have the sexes work in unison but in different areas, apart from and independent of the other. Women are to bear children, suckle them, rear them, and those who have none are to aid them in securing what every child should have. The work a mother has to do in pregnancy should not tend to damage the child. The question of abolishing the legal contract in marriage deals slashing blows at modern ideas. If love is the sole bond then the waning of love must release from the bondage. But we doubt if any man will want to marry the terrible mannish woman. "More and more the hidden male emerges from the female wreckage." Woman has been striving after masculinity all these years. She has gained the gift, but at a tremendous price.

It would take many pages to give an idea of Miss Kenealy's book. She deals with the evolution of sex, the female brain, sex instincts; how feminist doctrines and practice destroy womanly attributes, morale and progress. There is much that is true and the present attitude of young men confirms it, but we cannot see the terrible results foretold; rather, woman should be considered drunk with her new power, of which she will tire when she is required to face man's obligations as well as his privileges.

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

ANNUAL REPORT OF THE DEPARTMENT OF HEALTH. City of Newark, N. J. (Department of Public Affairs). Illustrated. Newark: The Essex Press. Pp. ix-240.

THE FOUR JUST MEN. By EDGAR WALLACE, Author of *The Clue of the Twisted Candle*, *The Secret House*, *Green Rust*, etc. Boston: Small, Maynard & Co. Pp. i-310.

VACCINATION IN THE TROPICS. By W. G. KIND, C. I. E., Colonel, I. M. S. (Retired); Late Sanitary Commissioner with the Government of Madras, and Superintendent General of Vaccination and Inspector General of Civil Hospitals in Burma. Illustrated. London: Tropical Diseases Bureau, 1920. Pp. vi-64.

THE DEVELOPMENT OF THE HUMAN BODY. A Manual of Human Embryology. By J. PLAYFAIR McMURRICH, A. M., Ph.D., LL.D., Professor of Anatomy in the University of Toronto; Formerly Professor of Anatomy in the University of Michigan. Sixth Edition, Revised and Enlarged. Illustrated. Philadelphia: P. Blakiston's Son & Co., 1920. Pp. x-501.

Practical Therapeutics and Preventive Medicine

A Compendium of Treatment and Prophylaxis, Original and Adapted

Intravenous Mercuric Iodide in Syphilis.—R. L. Spittel (*Lancet*, February 14, 1920), working on the assumption that intravenous mercury and iodide would give even more favorable results in conjunction with arsenic preparations than does the intramuscular medication, has given over four thousand injections of the following preparation into the vein during the last four years:

Mercuric iodide,	50 grains
Sodium—or potassium—iodide,	8 dr.
Phenolphthalein, 0.5 per cent. sol.,	20 minims
Sodium hydrate, 25 per cent. sol.,	about 2 dr.
Distilled water,	to 40 oz.

The sodium hydrate is added last and slowly. When the neutral point is reached it is put in drop by drop until a clear pink color is reached. The solution keeps indefinitely but tends to become decolorized. It may always be restored to normal by the addition of more sodium hydrate.

Eight to twelve c.c. of this solution, diluted to twice the amount and filtered, is the dose to be given into the vein. The reaction to small doses is little or none, but if larger doses are given chills, fever, and abdominal pains with diarrhea may result. The symptoms of mercurialism must of course be watched for. The results of such injections are much quicker than when the ordinary methods are used, both from the standpoint of the Wassermann reaction and from the effects on syphilitic lesions. The course of treatment consists of five or six injections of salvarsan and a similar number of mercuric iodide injections given every seven to ten days, alternately or in whatever sequence seems best. Prolonged treatment with mercury by mouth or inunction should be continued for a year or so even if the serological test is negative, as a matter of precaution.

Frontal Sinus Drainage.—Max Unger (*American Journal of Surgery*, May, 1920) employed the following technic in frontal sinus drainage: The nasal mucosa is anesthetized and the frontal sinus is probed. The probe is first used by itself to determine the size and the direction of the fronto-nasal opening. If the opening is obstructed by the middle turbinate this must be removed. The size and direction of the opening having been ascertained, the probe is then pushed through the lumen of the proper sized catheter to its end. The probe, encased in the catheter, is then reinserted in the frontal sinus. The catheter is held loosely by the fingers of one hand and the probe is gently withdrawn by the other, leaving the catheter *in situ*. The catheter is then grasped near its entrance into the opening with a nasal forceps and pushed further into the frontal sinus as far as it will easily go. Being flexible it will pass over projections that will block a metal catheter. The lower end of the catheter is then cut off intranasally, so that the remaining portion rests on the floor of the nose. At the end of this procedure there is then left a tube about two and a half inches in length, extending from the floor

of the nose up into the frontal sinus. This tube is left in place for one to two days, when it is removed and replaced by another. Before the tube is replaced the sinus can be irrigated. The catheter is cut three and a half inches long to begin with because its lower end will then project from the nose after its tip is in the sinus and furnish a place for holding it when the carrying probe is withdrawn. If linen or silk catheters are used, they should be dipped into hot water before being inserted into the nose, in order to make them softer.

Intravenous Injection of Hypertonic Glucose Solution in Chronic Nephritis with Azotemia.—F. Rathery and H. Boucheron (*Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, January 22, 1920) calls attention to the fact that in chronic nephritis with nitrogen accumulation in the blood intravenous injection of thirty per cent. glucose solution fails to exert its usual diuretic effect. Careful clinical tests showed that such injections caused, in these cases, a diminution of urinary output, including that of total nitrogen, urea, sodium chloride, and ammonia. In two patients with pronounced azotemia the latter was made considerably worse by the measure, and in one case with moderate azotemia the blood urea was temporarily increased. These changes were often more marked two or three days after the glucose injection than on the next day.

Surgical Treatment of Acute Empyema by Valve Drainage.—William Reid Morrison (*Boston Medical and Surgical Journal*, April 8, 1920) sums up as follows the advantages of valve drainage: An indirect valve opening is made in the chest. A valve made of the living tissues is the most efficient type because it does not get out of order; mechanical valves in aspirating trocars, and devices, such as a rubber dam pasted on three sides of a wound, are less desirable. In cases of pneumococcus and mixed infection, masses of fibrin, detritus and pus are readily removed. The gloved finger is able to break up any recently formed adhesions which may anchor the lung and prevent its expansion. Foreign bodies, if any, may be extracted. Collapse of the lung, mediastinal flapping and pneumothorax may be avoided, with more rapid convalescence, avoiding chronic empyema. He further says that no empyema should be operated on before a careful consultation with the medical man in charge of the case. Too early or too late operation is to be avoided; the duration, extent and virulence of the process in the lung, embarrassment of respiration from large amounts of fluid, and progress of the case are the factors that influence the surgeon's judgment. Local, combined with paravertebral injection, is the anesthetic of choice. In pneumococcus cases, valve drainage with pleurotomy or rib resection with indirect drainage of the chest may be used to advantage. In streptococcus cases, particularly in hemolytic streptococcus

infection, Kenyon's tube, with or without suction, or repeated aspirations, may be of value, allowing no air to enter the chest. The surgical treatment should be supplemented by careful attention to a high caloric diet, principally milk and raw eggs for the first few days. Medication in the form of digitalis leaves or other cardiac stimulants to tide over the lung infection, morphine for pain, tincture of nux vomica as an appetizer, and later iron are given as indicated. Good nursing, warmth, and fresh air are essential. Early bottle blowing and later proper gymnastic exercises are desirable to stimulate lung and chest expansion and prevent deformity. A half sitting position aids respiration and drainage after operation. A direct opening into the pleural cavity should not be made in acute empyemata. The writer has not been favorably impressed by the use of serological treatment.

General Anesthesia.—A. R. Egaña (*Semana Medica*, April 29, 1920) sums a lengthy article by stating that for short operations, where absolute muscular relaxation is not necessary, nitrous oxide and oxygen is the anesthetic of choice. He prefers Gwathmey's apparatus as it conforms to the conditions required, namely, easy graduation of the proportion of the gases, valves of easy access, easy and rapid utilization of ether when required, and warming of the anesthetic vapor.

Where muscular relaxation is imperative and especially in abdominal surgery, the nitrous oxide-ether sequence is the best. Chloroform owing to its dangers is inferior to ether, with which, however, it may be readily combined.

The open or semiopen method of administering ether is advisable except when the intrapharyngeal route is necessitated, as in operations on the neck, the face, the skull or in the ventral position. The intratracheal route is useful in operations on the thorax, while rectal administration of ether in a five per cent. solution in oil is quite feasible.

Severe Cerebral Toxemia After Intravenous Novarsenobillon.—R. J. G. Parnell and S. F. Dudley (*Lancet*, January 24, 1920) report a case of secondary syphilis which was being treated with this arsenic compound. The first dose was 0.45 gm. producing no reaction and the second, 0.9 gm. given four days later produced no reaction until fifty-six hours after injection into the vein. The patient began to vomit and during the next three days he had a series of seven epileptiform convulsions with unconsciousness, biting of the tongue, incontinence of urine and feces, together with a macular eruption on the skin, marked cyanosis and failing pulse. Adrenalin injections, calomel in hourly doses, and lumbar puncture failed to relieve the symptoms, so oxygen inhalations were given to combat the evident anoxemia and caffeine 0.2 gm. with urotropin 1.5 gm. in 15 c.c. of sterile distilled water was given, in accordance with the work of H. Michel, to relieve the maniacal state, probably through the great diuresis resulting. Five hours after the injection was begun and the oxygen inhalations were started the patient had become entirely rational and thereafter made an uneventful recovery, though he suffered from a partial amnesia for fourteen days.

Treatment of Tuberculous Glands of the Neck.

—A. Wiese Hammer (*Medical Council*, June, 1920) thinks that not every case demands surgical interference. In cases where the affection seems to recede at times the patients recover under proper hygienic treatment supplemented by medical measures. X ray treatments tend to produce fibrous tissue which is a serious obstacle to operation at a later date. In obstinate cases operative measures offer two great advantages, viz., the prevention of sinus formation and of unsightly cicatricial formation and the elimination of tuberculous infection from the body. Operation to be successful must be radical; partial removal is useless. The usual incision is along the whole posterior length of the sterno mastoid muscle from the mastoid process to the clavicle. Hammer prefers incisions which follow the circular furrows on the neck, thus leaving far less unsightly scars than by the linear methods of incision. In any incision the skin and platysma are reflected, bringing the sterno mastoid into view, which is then divided. Great care must be exercised against injuring the internal jugular vein, and the occurrence of air embolism. The glands are stripped by blunt dissection from the subclavian and internal jugular veins, and from the space posterior toward the trapezius muscle, care being taken not to wound the thoracic duct.

Chlorine Antiseptic.—Walter Estell Lee (*Annals of Surgery*, June, 1920) gives the clinical uses of sodium hypochlorite, chloramine-T, and dichloramine-T as follows:

1. The direct germicidal effect of all the chlorine antiseptics is dependent upon the liberation of their chlorine and the combination of this chlorine with bacterial protein.

2. The rapidity with which the hypochlorite solutions liberate their chlorine necessitates, in order to avoid the destruction of living tissues, the presence of large masses of available protein (devitalized tissues and profuse wound exudate) or the use of such dilute solutions that a safe margin in the relative masses of the active chlorine and available protein is insured. Thus the usable strengths of hypochlorite solutions, which should be less than 0.5 per cent., liberate such a small mass of chlorine that their direct germicidal effect is almost negligible. But, unlike the other chlorine antiseptics, they exert a very definite indirect germicidal effect by the formation of hydroxides which act as solvents of the culture material provided by devitalized tissues and wound exudate.

3. The synthetic chloramines are more stable compounds of chlorine than the hypochlorites and therefore can be used in greater concentrations or larger germicidal masses. They act practically as reservoirs from which chlorine is slowly and automatically given off as the tissues present the necessary reacting substances.

4. The hypochlorite solutions are indicated where there are large masses of dead and devitalized tissues or profuse tissue exudate which cannot be removed by mechanical means. They should not be used where such as are not present or applied to tissues poorly supplied with blood, tendons or cartilage.

5. The chloramines are indicated where there is but little, if any, dead tissue, and where the wound exudate is moderate in amount. Their only value is as a germicide. When in the human tissues, they slowly liberate their chlorine over a period of from three to twenty-four hours and in sufficient quantities to automatically unite with the bacterial and other proteins presented by the wounds.

Operation for Urethral Strictures.—M. Stern (*International Journal of Surgery*, April, 1920) states that as all, or nearly all, strictures occur anterior to the superficial layer of the triangular ligament, this operation can easily reach them. Extravasation of urine or infiltrating abscesses are not to be feared in a surgical procedure which does not disturb the membranous or prostatic urethra lying posterior to the triangular ligament. An operation which is directed precisely to the diseased area, and which does not inflict injury to any other part of the urethra, must be conceived as a logical step to a cure, and as superior to procedures heretofore in vogue.

High Forceps Operation; Version and Cæsarean Section.—William B. Doherty (*International Journal of Surgery*, April, 1920) believes that Cæsarean section is rapidly gaining favor in the management of labor in the presence of pelvic distortion among the most conservative obstetricians and surgeons, yet in these borderline cases, unless there is a marked neurotic and debilitated condition of the woman, it is better that she go into labor and the measures advocated be attempted before resorting to the Cæsarean operation. With capable surgeons and maternity hospitals which can now be reached in a few minutes and the improved technic which obtains, the chances for the safety of the woman and her child in a case of pelvic contraction are far better than they were a few years ago.

The Clinical Importance of Anatomical Anomalies in Biliary Surgery.—Daniel N. Eisendrath (*Boston Medical and Surgical Journal*, June 3, 1920) says that recent anatomical studies have shown that the normal angular mode of union of the cystic and hepatic ducts is present in only seventy-five per cent. of the cases; that the cystic artery is a single structure and has its generally accepted origin in only about eighty-eight per cent.; and that there are two cystic arteries in twelve per cent. of individuals. He describes with illustrations the variations in the relation of the right hepatic artery to the main hepatic duct; variations of the gastroduodenal artery; anomalies in origin of a single cystic artery; relation of a single cystic artery to the main hepatic duct; two cystic arteries which may both arise from the right hepatic, one from the right hepatic and one from the gastroduodenal artery, one from the right hepatic and the other from the main hepatic, or both from the left hepatic; variations in the course and mode of union of the cystic and hepatic ducts, and variations in the hepatic ducts. Some of these variations in anatomical structure are of much importance, for their presence may give rise to accidents during operation.

Treatment of Fracture of the Ulna with Dislocation of the Head of the Radius.—C. Dujarier and P. Mathieu (*Paris médical*, April 10, 1920), from experience with a personal case and study of the literature, have reached the conclusion that reduction of the radial head alone in recent cases is not always followed by a sufficient degree of reduction of the ulnar fracture, so that actual osteosynthesis is advisable; indeed, persistent shortening of the ulna would in itself predispose to recurrence of the radial dislocation. Reduction of the ulnar fracture alone does not generally result in reduction of the radial dislocation. The capsule often becomes interposed beneath the radial head, requiring operation upon the humeroradial joint. Evidently two operations, one upon the radial dislocation and the other upon the ulnar fracture, are required in these cases. Abadie thinks that the reduction of the ulnar fracture should precede the reduction of the luxation, the latter being facilitated by the former procedure. The authors believe, however, that in recent fractures, i. e., fractures in which the ulna is not yet in process of consolidation in a faulty position, it is well first to reduce the radial head by arthrotomy, remove any interposed portion of capsule, and restore the joint by capsulorrhaphy. Reduction and fixation of the ulnar fracture are thereby greatly simplified. In long standing cases, in which the ulna has healed in a faulty position, with angular deformity and overriding, it would perhaps be better to begin by liberating the ulnar fragments, next reduce the radial luxation, and finally proceed to operative fixation of the ulna. Resection of the head of the radius should not be resorted to until after an open restoration of the joint has been attempted.

Application of War Methods to Civil Practice.—A. Bowlby (*Lancet*, January 17, 1920) discusses the significance of the surgical discoveries of the war as regards treatment in civil practice. Shock, being due in part to privations suffered by the soldier before injury, is not so frequently found in civil life but when it is present it must be treated with warmth, fluids, rest, and morphine. It must be guarded against by the proper care of the patient during the period of temporary treatment as with splints, to prevent further damage of tissue or unnecessary pain during transportation. It is possible to train orderlies to prepare a fractured femur for transportation with the Thomas outfit more suitably than the trained surgeon could have done it before the war. If the patient be in shock and unable to retain fluids by mouth, rectal administration is indicated, as fluids absorbed by the gastrointestinal mucosa are of more lasting benefit than those put into the vein. *In extremis*, however, intravenous fluids are necessary and in the opinion of the writer, six per cent. gum arabic solution in saline is the most useful of all except blood itself.

Where anesthesia must be used shortly after recovery from the more urgent symptoms of shock, it was found that ether, though unlikely to cause pulmonary conditions or vomiting when warmed, did produce a dangerous and prolonged lowering of blood pressure. The most satisfactory results were obtained with nitrous oxide and oxygen com-

bined with local infiltration of the incision region, particularly in abdominal operations.

The advance in treatment of fractures is summed up in the statement that during the last half of the war, fractures were treated by suspension and extension so that the circulation, nourishment, and mobility of the extremity were maintained as far as possible. Regarding wound infections, the points emphasized are, 1, the uselessness of antiseptics in grossly infected wounds; 2, the importance of excision of damaged tissues around the wound with either primary or delayed primary suture; 3, the great danger of secondary infection of the wound if not quickly sutured; 4, the value of irrigation, as by the Carrel method if properly carried out, in the cure of suppurating wounds.

Electrical Osmosis of the Eye.—Roux, P. Girard, and Morax (*Paris médical*, April 10, 1920) report experimental work in which a cup containing solution of salt was placed as positive electrode over the cornea of a rabbit and a negative electrode placed over the back of the neck. Upon passing a current, increased intraocular tension results if the solution in the cup contains magnesium sulphate. If, on the other hand, the solution is one of barium chloride, reduction of intraocular tension occurs and the eye shrivels. The opposite eye and the eyes of another animal were used as controls. The authors hope by application of this principle to obtain useful therapeutic effects in certain eye affections.

Splints Used for Peripheral Nerve Cases at the U. S. Army General Hospital No. 11.—Robin C. Bureki (*Archives of Neurology and Psychiatry*, February, 1920) reports that at Army General Hospital No. 11 it was decided that the splints which had been applied in the nerve cases had numerous disadvantages. They were heavy and cumbersome and in a large number of cases were retarding rather than aiding recovery. With these faults in mind, each lesion was studied from the standpoint of splints, and a special group of splints was designed for each type of case. These were then tried out and the one found by actual practice to be the more satisfactory was adopted as a standard splint for a given lesion.

Transplantation of Kidney and Ovary.—Carleton Dederer (*Surgery, Gynecology and Obstetrics*, July, 1920) presents the following conclusions from experimental transplant.

1. A homotransplanted kidney during twenty-six days has passed the same functional tests as are required of normal kidneys.

2. In dogs of the same litter a homotransplanted kidney and ovary lived for twenty-six days. Pathological examination showed that the organs reacted to the severe constitutional infection, distemper, in a manner similar to that in which the animal's own organs reacted.

3. Phenolsulphonephthalein after being injected into the external saphenous vein began to be excreted from a homotransplanted kidney in two minutes and forty seconds.

4. It is possible in making a homotransplantation of the kidney to get a satisfactory arterial anastomosis by suture when the renal artery is less than a millimetre in diameter.

Submucous Resection of Nasal Septum.—W. D. Dunning (*American Journal of Surgery*, May 1920) states that the advantage of the submucous operation over other operations for deflection are:

1. That no mucous membrane has been destroyed.
2. That spurs and deflections have been entirely removed with the thickening of the septum.

3. That the ridge of cartilage which is wedged in between the lateral cartilage has not been interfered with, and there is absolutely no danger of a falling or saddleback nose.

Mercury in the Treatment of Syphilis.—Louis D. Smith (*Illinois Medical Journal*, May, 1920) has used mercurosal (or disodium mercuri salicylacetate) with satisfactory results. This salt is derived from mercuric acetate and salicylacetic acid and contains forty-four per cent. metallic mercury by weight. He has demonstrated that this preparation, in a dosage of five c.c. containing over one-half grain of mercury, answers the question of mercury medication very well, as by its use it is possible to employ a larger dosage of mercury more safely and more painlessly than by any other method.

The Use of Radium in Gynecology.—William C. Gewin (*Southern Medical Journal*, July, 1920) says that radium is the treatment of choice, a, in cases of menorrhagia of menopause not associated with large fibroid tumors and in which the possibility of carcinoma has been eliminated; b, in cases of menorrhagia in patients between thirty-five and forty years of age who have small mucous fibroid tumors without malignancy; c, in cases of myoma in which operation is contraindicated; d, in cases of menorrhagia in young persons resistant to all medical treatment, and in all cases with a malignant tendency; after operations for cancer; in all inoperable cancers to relieve pain, eradicate odor and stop hemorrhage. Radium will render operable many inoperable cases, and is practically the only means of relief in cases of recurrent carcinoma of the uterus.

Value of Radium in the Treatment of Bladder Tumors.—J. T. Gerachty (*Southern Medical Journal*, July, 1920) says that while benign and malignant papilloma and the early papillary carcinoma disappear under the influence of radium, the infiltrating types have proved very resistant to this agent. Therefore, when the infiltrating character of the growth has been determined, and when the tumor is sufficiently localized to permit of complete removal, he performs a radical resection. Following the removal of an infiltrating papillary carcinoma, cystoscopy should be done at an early date, as the not infrequent recurrences will yield promptly in many instances to radium, notwithstanding the resistance of the primary tumor. The use of radium has not diminished the tendency of bladder tumors to recur, but the recurrence responds to radium in most cases. Radium has proved to be a valuable aid in the treatment of bladder tumors, and, while the results obtained in the infiltrating types are far from satisfactory, improved technic whereby more intensive radiation may be safely accomplished offers a more encouraging outlook in the future handling of these cases.

Proceedings of National and Local Societies

BRITISH MEDICAL ASSOCIATION.

*Eighty-eighth Annual Meeting, Held June 25, 1920,
at Cambridge, England.*

(Concluded from page 432.)

SECTION IN MEDICAL EDUCATION

The President, Sir GEORGE NEWMAN, in the Chair.

President's Address.—Sir GEORGE NEWMAN, chief adviser to the Ministry of Health, said that the establishment of clinical teaching units was but an expression of the growth of integration. The clinical unit was merely a matter of convenient arrangement by which three general advantages were secured. 1. The clinical teacher devoted a regular and substantial portion of his time to his teaching work and instead of being casual, secondary, or spasmodic, it became his chief task; for the student instruction in clinical medicine and surgery was thus systematized, thorough, and always available. 2. The unit consisted of a staff of competent men working as a team who pooled their experience—the physician, the assistant physician, the resident physician and the house physician, wards, outpatient department, laboratory, auxiliary departments for special forms of treatment, all in a composite unit. 3. There was full integration of the science and art of medicine and surgery, the teaching of which could thus be raised to university standard. There was the association of research with study, and the study itself was intimate and intensive; it should comprehend Sir James Mackenzie's subjective and associated phenomena, it should investigate the mechanism of symptoms, and it should follow end results back to their origins. At Edinburgh there were seven surgeons, with Sir Harold Stiles as Regius professor of clinical surgery, he himself an assistant surgeon, a clinical tutor, and a house surgeon. The unit contained forty-four beds, outpatients, and laboratory accommodation. The work of the week comprised ward clinics, systematic clinical lectures, tutorial classes, and operations.

Sir George said that, speaking generally, the main reforms needed in the medical curriculum were four: 1. A lightening of the curriculum at both ends; in other words, fuller preparation in science before entrance to the medical school, and a postponement of instruction in certain specialties and in general practice to the postgraduate period in order to provide continued education of the qualified man, teaching which required organization on the basis of professoriate, hospital, laboratory and clinical experience, which may well be organized in such cooperative practitioner clinics as those devised by Sir James Mackenzie at St. Andrews. This question of lightening without lengthening the curriculum was of cardinal importance. Much of our trouble arose from the overloaded condition of the five years. There was insufficient time allowed for true study, for digestion and assimilation. He suggested several remedial steps and remarked that the true criterion of training in medicine was equipment for life, not preparation for an examination. 2. A

fuller study of the sciences preliminary to medicine and a nearer application of these subjects to clinical work. Above all, there was great need for biology, anatomy and physiology. 3. Development of clinical teaching of university standard, particularly in relation to the beginnings of disease, the child and the outpatient; the science of prevention; the closer integration of various forms of clinical practice and of clinical with intermediate study; concentration on the protean diseases of tuberculosis, malaria, venereal and malignant diseases; an understanding of the social side of therapeutics, environment, diet, occupation and the use of physical agents, as well as the social aspects of disease. Some of this should clearly come after graduation. 4. There was need of further state aid, though with a minimum of state control. The cost of proper medical training had now risen beyond the means of the average man and yet it was in the interest of the state to secure well equipped doctors. To provide a satisfactory medical education there were needed: a, better teachers and better paid teachers; b, clinical units; c, improved laboratory accommodation and better equipment; d, an extension of hospital and clinic facilities for teaching. All this meant money and organization, both of which had been lacking in the past. The education of the medical man was no longer merely a professional interest. It was of national concern, for the health of the people was the principal asset of the state. Sir George said that while some advocate removal of preliminary science from the curriculum, he was convinced that it was more essential than ever. Physics, chemistry and biology were key subjects, absolutely fundamental. Newman was particularly insistent upon the claims of biology. The two chief needs of English medicine were a, the full integration of its several branches and constituent parts, and b, its new relationship to sociology. Man was a social animal and all disease had its social aspect. The student must be taught this, he must learn to use his stock of knowledge socially as well as logically. The great problems which would face him in practice had a social setting—tuberculosis, infant mortality, rickets, physical impairment, venereal diseases, heart disease, mental abnormality, all bore a highly complex relation to society, industry and government.

Mr. SYDNEY J. HICKSON, F. R. S., professor of zoology in the University of Manchester, made some caustic remarks with regard to the standard of general education of medical students. He declared that the real difficulty with all English science classes in the first year of medical study is caused by a minority, but often a substantial minority, of students with a lower standard of school education. Too many students were entered by the medical schools whose vocabulary and facility in composition were not sufficient to enable them to profit by the lecture system, or to express what little they had learned in a written examination. Further, and still more important, many students did not possess a mind trained to remember or to think. It was these students who acted

as a drag upon the machine and so hindered the development of medical courses in science on the lines which would be most useful for medical men. The first step in this direction was to insist that the lowest standard accepted for registration should be that of the matriculation examination of the British universities. The five years' study of a medical student was not enough to enable him to grasp all the knowledge that it was desirable or even necessary for him to have as a qualified man.

MR. ARTHUR KEITH, F. R. S., Hunterian professor, Royal College of Surgeons of England, thought it was not the student who was at fault but the teachers and that the problem to be faced was not how to improve the education of the medical student but how to educate and reform his teachers. In fact the real problem to be solved was how a staff of specialist teachers was to produce an army of effective medical practitioners. Mr. Keith thought the specialist teacher should keep up his knowledge of general medicine and that at the great medical schools every teaching anatomist and physiologist should have to hold occasional clinical appointments up to their thirty-fifth year. In seven cases out of ten the practitioner could not make a diagnosis unless he knew the exact situation and action of the multitude of parts which made up the human body. But when we turned to our textbooks of anatomy we found that less than half of their pages were devoted to a study of the action and uses of parts. It was not, so in the early textbooks, they were keys to the living body. Textbooks now were masses of description. Our examination papers were a wearisome repetition of "describe" this and "describe" that, as if a student could apply pure description in practice, or obtain any assistance from it in the diagnosis, treatment, or prevention of disease. Here again the reform must lie with the teachers.

Professor Sir E. RUTHERFORD, F. R. C., was of the opinion that as large a proportion as possible of medical students should receive a sound training of honors standard in pure science before or during their more professional studies. The best method of dealing with the present unsatisfactory situation seemed to require a preliminary knowledge of science, and particularly of physics and chemistry, before admission as a medical student. This preliminary training could best be given in the schools, where instead of being concentrated in a brief course two years or so might be devoted to gaining a sound knowledge of some branches of physics and chemistry. The element of time was of great importance in gaining a grasp of scientific principles, and for this the present university training was much too concentrated.

Dr J. LORRAIN SMITH, professor of pathology at the University of Edinburgh, stated that in general the present curriculum was wasteful of the students' time because it gave a general introduction to the sciences but left it to the later teachers or the students themselves to apply the principles and methods of these sciences in the various branches of medicine. A continuity of teaching would concentrate the intellectual effort and would attain with much more certainty the standard of

work which the curriculum was designed to reach.

MR. ARTHUR SMITHELLS, F. R. S., professor of chemistry at the University of Leeds, criticized severely the cram system of preparing medical students for the work of medicine. He pointed out that a conventional syllabus had been created and the subject had been scheduled, with the inevitable results. The teacher was put in bonds and in one way or another, irrespective of his own views and methods, must prepare the student for the prescribed test as applied by any appointed outside person. The examination became the goal, the syllabus the beaten track, and the spirit of true study took flight. Medical students should be taught some chemistry at school, but the teachers of chemistry should be men of experience, possessing a wide outlook.

SECTION IN PATHOLOGY AND BACTERIOLOGY

The President, Professor J. LORRAIN SMITH, M. D., F. R. S.
in the Chair.

Present Position of Cancer Research.—Dr. J. A. MURRAY, in a further discussion of the subject, observed that for some investigators the conviction was gradually gaining ground that knowledge of the fundamental processes of cell life was not yet sufficiently advanced for the special purpose of cancer research. The cancer cell was in some way different from the cells of the same kind among which it originated. The nature of the change was still unknown. It was probably thoroughgoing and in most instances of a surprising degree of permanence. All the differences which had been found thus far between cancer cells and those of adult tissues could be paralleled in rapidly growing tissues of the embryo. Cancerous tissue, for example, contained more water of imbibition than adult tissue, and the most rapidly growing tumors had the highest proportion of water to solids. In consequence some slowly growing tumors were found to be less watery than testis and embryonic tissues. The differences in this respect were not absolute, so that no one could say that no cancer had less than a certain percentage of water and below this level were ranged all normal tissues, embryonic and adult.

The line of investigation which was being pursued at present was the study of normal and tumor cells by culture outside the body. Murray was of the opinion that when technical improvements had increased the flexibility of this method it should provide a powerful means of attack on the fundamental problems of the disease. At present the technical difficulties made the mere achievement of maintaining tissue cultures something of a *tour de force*. The one positive character of new growths was their progressive proliferation uninfluenced by the forces limiting the increase of the elements of healthy or diseased tissues. The transplantable tumors of laboratory animals presented this problem. The subtlety of the cellular derangement and its close contact with the fundamental problems of biology gave an atmosphere of adventure to every attempt, however indirect it might seem, which human ingenuity devised to elucidate the harmonies and contradictions which lay on every side of the problem of cancer.

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Original Communications

THE INFLUENCE OF THE COLOR OF URINE ON READINGS OF THE PHENOL-SULPHONEPHTHALEIN TEST.*

By VICTOR COX PEDERSEN, A. M., M. D., F. A. C. S.,
New York.

The aim of this paper is to account for the fifteen per cent. apparent loss of dye, indicated by the readings of the scale, between the usual maximum of eighty-five per cent. of the material excreted by the patient in two hours and the one hundred per cent. of the phenolsulphonephtalein that has been injected. So far as a research of literature reveals, this question has never been fully studied, perhaps because the practical results have been regarded as good enough without settlement of this doubt.

I thought that much of this fifteen per cent. would be found absorbed by the color of the urine in such a way that a reliable percentage table could be evolved for the various colors of urine as given by Vogel's scale. Such tables would permit the readings to be brought to nearly an absolute total instead of as at present an indicated total with an error of about fifteen per cent. It was a great surprise, however, as shown hereinafter, to find that the darker the color of the fluid tested the higher the percentage of error in the reading.

The factor responsible is that of color alteration or combination, so that one cannot really match the beautiful reddish purple of the alkalized phenolsulphonephtalein test solution with the same quality of reddish purple in the urine, because the latter is materially altered by the urinary pigments. In fact, therefore, the test is in very large degree one of judging the intensity of two colors nearly alike but never absolutely alike in tone or quality.

The possible sources of destruction of a portion of the dye are metabolism, excretion, technic and vision. Each of these factors requires discussion.

The metabolic or physiological factors presuppose destruction of this fifteen per cent. of the dye in the liver or elsewhere in the body. Several authors suggest this explanation but literature records no experiments in support or denial of it. It is, of course, quite certain that at least some loss of this kind occurs, but the amount is probably amazingly small.

The excretory factors establish that after the second hour of the ordinary test very little of the dye is recovered. Of course if only fifteen per cent. would remain it could not be accurately read except by the author's (1) method of subdilution and computation. Several years ago I carried on a number of experiments which were never published. They tended to show that during the twenty-four hours following the test the percentage of dye was very hard to measure unless the total excretion during the first two hours was relatively low. As an average very little dye was recovered after the fourth hour of the test. If these observations were correct one may say that the entire excretion is over on an average of four hours.

The technical factors to account for the loss of the fifteen per cent. of dye are important and comprise chiefly losses during injection and deviations between measures. Elsewhere (2) I have stated: "It must be remembered that a cubic centimetre is about sixteen minims and that the loss of one drop is an error of nearly seven per cent. and two drops one of nearly fourteen per cent." Carelessness will, therefore, easily account for nearly fifteen per cent. Deviations between measures include those between the graduations of the cubic centimetre making the standard solution and those of the cubic centimetre syringe making the injection. These variations might again account for ten or fifteen per cent. As pointed out in the same paragraphs of the paper just referred to the following is important: "In order to avoid error in reading, exactly the same quantity must be used in making up the control or comparison solution, which should be accomplished by using the same syringe for measuring the fluid for the container as for the vein."

Visual factors comprise the variations in eyes from individual to individual and sometimes between the two eyes of one individual, in the perception of grades of color, absorption of color, hue of color, intensity of color and the like. As just stated the whole matter of reading the scale is the estimate of comparative intensity of slightly or greatly different colors rather than of depth of identity colors. Of course, the error in the eyes of a given observer is a constant factor of error for himself. Such error could not greatly affect clinical judgment of his cases unless more or less definite color blindness was present. For example, eyes which are five or ten per cent. above or below

*Read before the annual meeting of the American Urological Association, March 23-25, 1920.

the standard of color vision will hardly affect the interests of the patients, because all such a surgeon's reading for all his patients will contain the same five or ten per cent. of error, which thus practically eliminates itself.

It may be said that absorption error is different because all eyes, normal or otherwise, will have no escape from this error. In illustration, if that error in dark urines is an addition of ten, fifteen or twenty per cent. then a patient excreting absolutely only twenty per cent., during the first hour will be credited with readings of thirty, thirty-five or forty per cent. which are close to the normal minimum for the first hour. Again if his absolute excretion is forty per cent., then his readings will be advanced to fifty, fifty-five or sixty per cent. which again are practically the normal maximum for the first hour. Again a urine with a positive yellow like No. 3 of the Vogel scale will give much the same, although perhaps slightly lower errors. The tables of this paper, however, show that there is very little difference.

In brief, this question of color absorption in this article is somewhat analogous to the difficulties of reading small percentages except by the author's method of subdilution and computation described in the paper (2) already quoted, in these words: "Those who have done much of this work are familiar with the fact that the most convenient readings on the colorimeter are from about thirty per cent. upward, and with the fact that below thirty per cent. the colors are so pale as to make it almost impossible to read percentages within five per cent. of error, which has been accepted as the standard of accuracy. By my method of subdilution I feel that far more accurate readings may be obtained. The steps are as follows: When the quantity of dye in a specimen is obviously little, instead of raising this excretion to the dilution of 1,000 c. c., it is raised only to a prime factor of 1,000—for example, 50, 100, 200 or 250 c. c. The reading is then taken and must obviously be divided by the number of times which the prime factor of subdilution is contained in 1,000 which, following the foregoing prime factors in the order given, would make the divisors 20, 10, 5 or 4, and then if the method of subdivision had been followed this reading must be again multiplied by two to reach the correct result. A good eye for color with the aid of these procedures will make the reading almost absolutely accurate."

The question of error through color absorption or combination is in a degree academic when one considers the large amount of excellent work done with the phenolsulphonophthalein test as it stands. The matter has a practical value of even greater degree when one considers the borderline or doubtful cases in which a patient's urine may give a reading showing an indicated excretion of fifty per cent. but through its having a dark color may have an absolute excretion of only thirty per cent. Such a patient might be subjected to operation and perish because of this variation between his indicated and absolute excretion. Every urologist has had patients who died notwithstanding a seemingly favorable phenolsulphonophthalein reading. One cause may be this color absorption error in the test and subsequent judgment therefrom. The average

report does not note or respect the color of the urine. Highly pathological urine is usually largely altered in color.

It may be urged that chemical hematology of the blood for its content of urea, uric acid, creatinin, sugar, chlorides and the like is an almost infallible check on all this work. I always employ it with great satisfaction. It should never be omitted even in apparently favorable cases and is essential in all borderline cases. Unfortunately, however, much modern kidney surgery must be done away from laboratories equipped for this work. If, therefore, the detection and correction of a color absorption error will aid the surgeon who cannot reach such a laboratory quickly, much practical value should be the result. This fact again emphasizes the great practical value of this entire matter.

In the following observation caution was taken to eliminate even small errors in measuring, mixing, readings, the Heliger colorimeter and my own eyes. Each of these five matters deserves separate notice.

The measuring contained the following checks. The same litre measure was used throughout and accurately levelled. The alkali was dumped in first to avoid addition to the 1,000 c. c. of the stock or the test solution or urine. The same syringe (one c. c. capacity) graduated in tenths was used to make all stock solutions and all additions from small to high percentages. The drop was washed off the needle into the stock or test solutions, thus avoiding the approximate seven per cent. of error by its loss, previously discussed. The test cup was always dumped back into the litre graduate to avoid decrease below the 1,000 c. c. Subdilution by the author's method was not employed except in the tables where so stated, because it was thought that the average reader would prefer to have every test brought up to 1,000 c. c. These tables, as given, were really control tests. Mixing was felt to require pouring the stock and test fluid from the litre graduate into a pitcher and back three or four times. The majority of the fluids were so alkaline as to be slippery to the finger and the color unquestionably uniform.

Readings were felt to demand the following checks: A white light such as is used in microscopy was very serviceable because it did not add to the reddish or yellow color of the test fluid. The test wedge was not changed on the scale until the reading of one test was compared with the next preceding test. Thus, for example, the reading for twenty per cent. was compared with forty per cent., and forty with sixty and sixty with eighty before the wedge was changed in position to make an independent reading for the newer and higher percentage. Binocular vision was less tiresome than monocular. Very often the scale was set at the point of known strength of the test fluid, say sixty per cent., on the chance that the reading would be correct. In not one instance, however, was the reading correct, but always too low, showing that the indicated percentage was much higher than the absolute content in the fluid. Where double readings occur in the tables it means that the eyes were shut, quickly opened and a slightly different reading obtained.

As a test of my own vision the wedge of the Heliger colorimeter was filled with properly pre-

pared stock solution, well alkalized and containing a cubic centimetre of phenolsulphonephthalein. Then a thousand c. c. of well alkalized distilled water were taken. To these were added (from the same syringe as was used in making up the foregoing stock solution) phenolsulphonephthalein ascending from one tenth c. c. to one c. c. A reading of the scale was taken at each, one tenth c. c. added and all readings were found to be without error in the scale for each known quantity of dye. This test not only proved my own perception of color to be very good but established the accuracy of my colorimeter.

In the following tables of readings in the order given distilled water was used artificially colored to imitate closely numbers 4, 3, 2 and 1 of the Vogel scale. The work was begun with the dark fluids on the ground that error would be greatest in them.

Tables numbered 1 and 2 were the first made. Ordinary electric light was used, which, although not white, did not seem to change the readings greatly from those of all other tables which were made with artificial or solar white light.

The stock solution for comparison is 1,000 c. c. of distilled water, alkalized with fifteen per cent. sodium hydroxide, with the phenolsulphonephthalein added, usually one c. c. or in larger proportional amounts such as one and one tenth or one and one fifth c. c.

TABLE 1.

VOGEL'S SCALE 4		REDDISH YELLOW		
A	B	C	D	E
Stock Solution	Test Fluid	Absolute per cent.	Indicated per cent.	Indicated Error
1000 c.c. of distilled water alkalized with 15% sodium hydroxide with dye as stated below	Fraction of 1 c.c. of dye in 1000 c.c. of distilled water alkalized with 15% sodium hydroxide	Injected into test fluid	By readings of the Heliger colorimeter	
1 c.c.	0.1	10	25-30	15-20
1 c.c.	0.2	20	35-40	15-20
1 c.c.	0.3	30	45-50	15-20
1 c.c.	0.4	40	60	20
1 c.c.	0.5	50	70	20
1 c.c.	0.6	60	80	20
1 c.c.	0.7	70	90	20
1 c.c.	0.8	80	100	20
1.10 c.c.	0.9	90	110	20
1.20 c.c.	1.0	100	120	20

The error runs between fifteen and twenty per cent. and is most significant in doubtful cases in the readings between thirty and fifty per cent.

TABLE 2.

VOGEL'S SCALE 3		DARK YELLOW		
A	B	C	D	E
Stock Solution	Test Fluid	Absolute per cent.	Indicated per cent.	Indicated Error
1000 c.c. of distilled water alkalized with 15% sodium hydroxide with dye as stated below	Fraction of 1 c.c. of dye in 1000 c.c. of distilled water alkalized with 15% sodium hydroxide	Injected into test fluid	By readings of the Heliger colorimeter	
1 c.c.	0.1	10	20	10
1 c.c.	0.2	20	30	10
1 c.c.	0.3	30	40	10
1 c.c.	0.4	40	50	10
1 c.c.	0.5	50	60-62	10-12
1 c.c.	0.6	60	70	10
1 c.c.	0.7	70	78-80	8-10
1 c.c.	0.8	80	90	10
1 c.c.	0.9	90	97-100	7-10
1 c.c.	1.0	100	110	10

¹ My chemist, M. F. Schlesinger, A. B., M. Ph., informs me that he used for Vogel's scale 4 and dark colors a saturated solution of Bismarck brown and for Vogel's scale 3 and lighter colors a saturated solution of potassium bichromate. It may be well for any other observer desirous of repeating these tests to use the same dyes.

The error averages about ten per cent. Like that in Table 1 it is important in the middle of the scale for borderline cases.

The tables from 3 forward were made with white light. This fact tends to account for many double readings. Likewise when many tests are made consecutively the eyes weary and lose decision.

TABLE 3.

VOGEL'S SCALE 4		REDDISH YELLOW		
A	B	C	D	E
Stock Solution	Test Fluid	Absolute per cent.	Indicated per cent.	Indicated Error
1000 c.c. of distilled water alkalized with 15% sodium hydroxide with dye as stated below	Fraction of 1 c.c. of dye in 1000 c.c. of distilled water alkalized with 15% sodium hydroxide	Injected into test fluid	By readings of the Heliger colorimeter	
1 c.c.	0.1	10	15-20	5-10
1 c.c.	0.2	20	35-40	15-20
1 c.c.	0.4	40	55-60	15-20
1 c.c.	0.6	60	78-80	18-20
1 c.c.	0.8	80	95-100	15-20

TABLE 4.

CONTROL OF TABLE 3		METHOD OF SUBDILUTION		
A	B	C	D	E
Stock Solution	Test Fluid	Absolute per cent.	Indicated per cent.	Indicated Error
1000 c.c. of distilled water alkalized with 15% sodium hydroxide with 4 c.c. of dye	Fraction of 1 c.c. of dye in 250 c.c. of distilled water alkalized with 15% sodium hydroxide	Injected into test fluid	By readings of the Heliger colorimeter	
4 c.c.	0.1	10	15-20+	5-10
4 c.c.	0.2	20	30-40	10-20
4 c.c.	0.4	40	60+	20
4 c.c.	0.6	60	70-80	10-20
4 c.c.	0.8	80	90-100	10-20

To demonstrate the question of this paper without multiplying detail, from Table 3 forward only alternate percentages up to eighty will be used. In Tables 3 and 4 it is noticed that the error is again close to twenty per cent. in the midscale readings. The deep color of subdilution was a disadvantage and control tables with it were not tried further.

TABLE 5.

VOGEL'S SCALE 3		DARK YELLOW		
A	B	C	D	E
Stock Solution	Test Fluid	Absolute per cent.	Indicated per cent.	Indicated Error
1000 c.c. of distilled water alkalized with 15% sodium hydroxide with dye as stated below	Fraction of 1 c.c. of dye in 1000 c.c. of distilled water alkalized with 15% sodium hydroxide	Injected into test fluid	By readings of the Heliger colorimeter	
1 c.c.	0.1	10	20 ±	10 ±
1 c.c.	0.2	20	30 ±	10 ±
1 c.c.	0.4	40	50 ±	10 ±
1 c.c.	0.6	60	70 ±	10 ±
1 c.c.	0.8	80	90 ±	10 ±

As in the preceding Table 2 the error is very close to ten per cent.

TABLE 6.

VOGEL'S SCALE 2		YELLOW		
A	B	C	D	E
Stock Solution	Test Fluid	Absolute per cent.	Indicated per cent.	Indicated Error
1000 c.c. of distilled water alkalized with 15% sodium hydroxide with dye as stated below	Fraction of 1 c.c. of dye in 1000 c.c. of distilled water alkalized with 15% sodium hydroxide	Injected into test fluid	By readings of the Heliger colorimeter	
1 c.c.	0.1	10	20	10
1 c.c.	0.2	20	30	10
1 c.c.	0.4	40	50	10
1 c.c.	0.6	60	65	5
1 c.c.	0.8	80	85	5

In tables 4, 7 and 9, instead of dividing the readings by four to compensate for the subdilution 250, the stock solution was made up with four c. c. of dye and thus the scale readings were direct and not computed:

TABLE 7.
CONTROL OF TABLE 6

METHOD OF SUBDILUTION				
A	B	C	D	E
Stock Solution	Test Fluid	Absolute per cent. Injected into test fluid	Indicated per cent. By readings of the Heliger colorimeter	Indicated Error
1000 c.c. of distilled water alkalinized with 15% sodium hydroxide with 4 c.c. of dye	Fraction of 1 c.c. of dye in 250 c.c. of distilled water alkalinized with 15% sodium hydroxide			
4 c.c.	0.1	10	25	15
4 c.c.	0.2	20	30/35	15
4 c.c.	0.4	40	45/50	10
4 c.c.	0.6	60	65+	5+
4 c.c.	0.8	80	85/87	7

TABLE 8.
VOGEL'S SCALE 1 LIGHT YELLOW

A	B	C	D	E
Stock Solution	Test Fluid	Absolute per cent. Injected into test fluid	Indicated per cent. By readings of the Heliger colorimeter	Indicated Error
1000 c.c. of distilled water alkalinized with 15% sodium hydroxide with dye as stated below	Fraction of 1 c.c. of dye in 1000 c.c. of distilled water alkalinized with 15% sodium hydroxide			
1 c.c.	0.1	10	30	20
1 c.c.	0.2	20	30	10
1 c.c.	0.4	40	45	5
1 c.c.	0.6	60	65	5
1 c.c.	0.8	80	85	5

TABLE 9.
CONTROL OF TABLE 8

METHOD OF SUBDILUTION				
A	B	C	D	E
Stock Solution	Test Fluid	Absolute per cent. Injected into test fluid	Indicated per cent. By readings of the Heliger colorimeter	Indicated Error
1000 c.c. of distilled water alkalinized with 15% sodium hydroxide with 4 c.c. of dye	Fraction of 1 c.c. of dye in 250 c.c. of distilled water alkalinized with 15% sodium hydroxide			
4 c.c.	0.1	10	30	20
4 c.c.	0.2	20	35/40	15
4 c.c.	0.4	40	45/50	10
4 c.c.	0.6	60	65-	5
4 c.c.	0.8	80	85	5

Although the foregoing results seem to show that the apparent error in readings in dark fluids is between fifteen and twenty per cent. and that in light fluids between ten and fifteen per cent. the following two systems of controls were adopted: The full strength method and the dilute method. On the full strength principle 1,000 c. c. of plain distilled water solutions were taken, injected with the phenolsulphonophthalein from one tenth c. c. to eight tenths c. c. and readings at each step taken. Necessarily these were all normal. As each step was taken from one fraction to the next, dye was injected to bring the water up to the desired Vogel's scale color as stated in the tables 10, 11, 12 and 13. A fresh supply of water was used each time and the readings taken as stated with the resulting indicated errors.

By the dilution plan the eighty per cent. strength solution was made at once just as in the foregoing procedure, and then diluted to forty, twenty and ten per cent. With each dilution sufficient dye was added to maintain the proper Vogel's scale color. As in the first tables all these measures were identical and thus variations avoided. Tables 14, 15, 16 and 17 show these tests.

TABLE 10.
VOGEL'S SCALE 4 CONTROL BY FULL STRENGTH METHOD

A	B	C	D	E
Distilled water c.c.	Phenol-sulphonophthalein injected c.c.	Reading before injecting coloring matter V.S. 4	Reading after injecting coloring matter V.S. 4	Indicated error due to coloring matter
1000	0.1	10	20-25+	10-15
1000	0.2	20	30-35+	10-15
1000	0.4	40	50-55+	10-15
1000	0.6	60	70-75+	10-15
1000	0.8	80	90-95+	10-15

TABLE 11.
VOGEL'S SCALE 3 CONTROL BY FULL STRENGTH METHOD

A	B	C	D	E
Distilled water c.c.	Phenol-sulphonophthalein injected c.c.	Reading before injecting coloring matter V.S. 3	Reading after injecting coloring matter V.S. 3	Indicated error due to coloring matter
1000	0.1	10	30-35	15-20
1000	0.2	20	35-40	10-15
1000	0.4	40	50-58	10-15
1000	0.6	60	75-80	10-15
1000	0.8	80	95±	10-15

TABLE 12.
VOGEL'S SCALE 2 CONTROL BY FULL STRENGTH METHOD

A	B	C	D	E
Distilled water c.c.	Phenol-sulphonophthalein injected c.c.	Reading before injecting coloring matter V.S. 2	Reading after injecting coloring matter V.S. 2	Indicated error due to coloring matter
1000	0.1	10	25-30	15-20
1000	0.2	20	30-35	10-15
1000	0.4	40	50-55	10-15
1000	0.6	60	70-75	10-15
1000	0.8	80	90-95	10-15

TABLE 13.
VOGEL'S SCALE 1 CONTROL BY FULL STRENGTH METHOD

A	B	C	D	E
Distilled water c.c.	Phenol-sulphonophthalein injected c.c.	Reading before injecting coloring matter V.S. 1	Reading after injecting coloring matter V.S. 1	Indicated error due to coloring matter
1000	0.1	10	20-25	10-15
1000	0.2	20	30-35	10-15
1000	0.4	40	50-52	10-12
1000	0.6	60	70-75	10-15
1000	0.8	80	85-90	5-10

In the foregoing four control tables the second readings in Column D are minimums. They might be from two to five per cent. higher.

TABLE 14.
VOGEL'S SCALE 4 CONTROL BY DILUTION

A	B	C	D	E
Distilled water c.c.	Phenol-sulphonophthalein injected c.c.	Reading before injecting coloring matter V.S. 4	Reading after injecting coloring matter V.S. 4	Indicated error
1000	0.8	80	90-95+	10-15+
1000	0.4	40	50-55+	10-15+
1000	0.2	20	30-35	10-15+

TABLE 15.
VOGEL'S SCALE 3 CONTROL BY DILUTION.

A	B	C	D	E
Distilled water c.c.	Phenol-sulphonophthalein injected c.c.	Reading before injecting coloring matter V.S. 3	Reading after injecting coloring matter V.S. 3	Indicated error
1000	0.8	80	95±	15±
1000	0.4	40	50-55+	10-15+
1000	0.2	20	35-40	15-20

TABLE 16.
VOGEL'S SCALE 2 CONTROL BY DILUTION

A	B	C	D	E
Distilled water c.c.	Phenol-sulphonophthalein injected c.c.	Reading before injecting coloring matter V.S. 2	Reading after injecting coloring matter V.S. 2	Indicated error
1000	0.8	80	90-92+	10-12+
1000	0.4	40	50-53	10-13
1000	0.2	20	28-30+	8-10+

TABLE 17.
VOGEL'S SCALE 1 CONTROL BY DILUTION

A	B	C	D	E
Distilled water c.c.	Phenol-sulphonophthalein injected c.c.	Reading before injecting coloring matter V.S. 1	Reading after injecting coloring matter V.S. 1	Indicated error
1000	0.8	80	85-88	5-8
1000	0.4	40	47-50+	7-10+
1000	0.2	20	30+	10+

In order to produce the colors Vogel's scale 4-3-2-1 in tables 14 to 17, inclusive, it was found that the hypodermic syringe had to be filled four times for Vogel's scale 4; three times for Vogel's scale 3; twice for Vogel's scale 2 and once for Vogel's scale one in one thousand c. c. of water. In the dilutions for eighty per cent. to forty per cent. and from forty per cent. to twenty per cent. of the phenol-sulphonephthalein, when the stock solution was again brought up to the one thousand c. c. standard, sufficient coloring matter was introduced to secure a return to the proper Vogel scale color used for the next previous strength. In this way errors in this particular were eliminated because when forty per cent. was read off the coloring matter had been restored to the standard of the eighty per cent. solution. And so with the twenty per cent. to forty per cent. solution.

The preceding tables 1 to 17, both inclusive, complete the various observations with distilled water. The following tables 18 to 23 inclusive comprise the studies applied to mixed urines and developed by exactly the same precaution and technic. All these urines were unavoidably decomposed and turbid, but in a generous sense such changes made them simulate pathological urines well. The turbidity made the readings difficult.

TABLE 18.
VOGEL SCALE 4 TURBID URINE

A	B	C	D	E
Urine	Phenolsulphone-phthalein injected	Absolute reading in distilled water	Reading due to urinary coloring matter equal to V.S. 4	Indicated error due to coloring matter
c.c.	c.c.			
1000	0.1	10	25-28	15-18
1000	0.2	20	36-40	16-20
1000	0.4	40	50	10
1000	0.6	60	70	10
1000	0.8	80	85-90	5-10

TABLE 19.
VOGEL SCALE 4 CONTROL BY DILUTION

A	B	C	D	E
Urine	Phenolsulphone-phthalein injected	Absolute reading in distilled water	Reading due to urinary coloring matter equal to V.S. 4	Indicated error due to coloring matter
c.c.	c.c.			
1000	4	80	90±	10
1000	6	60	70±	10
1000	8	40	50±	10

TABLE 20.
VOGEL SCALE 3 TURBID URINE

A	B	C	D	E
Urine	Phenolsulphone-phthalein injected	Absolute reading in distilled water	Reading due to urinary coloring matter equal to V.S. 3	Indicated error due to coloring matter
c.c.	c.c.			
1000	0.1	10	25±	15
1000	0.2	20	36±	16
1000	0.4	40	50	10
1000	0.6	60	70±	10
1000	0.8	80	88-90	8-10

TABLE 21.
VOGEL SCALE 3 TURBID URINE CONTROL BY DILUTION

A	B	C	D	E
Urine	Phenolsulphone-phthalein injected	Absolute reading in distilled water	Reading due to urinary coloring matter equal to V.S. 3	Indicated error due to coloring matter
c.c.	c.c.			
1000	0.8	80	90-95	10-15
1000	0.4	40	50+	10
1000	0.2	20	30+	10

TABLE 22.
VOGEL SCALE 2 CONTROL BY DILUTION.

A	B	C	D	E
Urine	Phenolsulphone-phthalein injected	Absolute reading in distilled water	Reading due to urinary coloring matter equal to V.S. 2	Indicated error due to coloring matter
c.c.	c.c.			
1000	0.4	80	48+(50?)	88+(?) 8+(?)
1000	0.6	60	68+(70?)	8+(10?)
1000	0.8	40	48+(50)	8+(10)

In Tables 19 and 21 the urine was diluted with equal parts of water Vogel scale No. 4 then became practically No. 3 and Vogel scale became practically No. 2. Thus new controls were gained.

TABLE 23.
VOGEL SCALE 2 CONTROL BY DILUTION.

A	B	C	D	E
Urine	Phenolsulphone-phthalein injected	Absolute reading in distilled water	Reading due to urinary coloring matter equal to V.S. 2	Indicated error due to coloring matter
c.c.	c.c.			
1000	0.8	80	88-92	8-12
1000	0.4	40	48-50	8-10
1000	0.2	20	25-30	5-10

RÉSUMÉ

In order to correlate all the tests and to determine the average of errors from which to draw conclusions the following tables were prepared for each of the four colors used. It will be noted that these tables of averages confirm almost exactly the conclusions finally drawn by me.

AVERAGES OF ERRORS

Primary and control tests combined in the averages

TABLE 24.
VOGEL'S SCALE 4

Per cent. of phenolsulphone-phthalein	Tables of distilled water and urine							Averages
	1	3	4	10	14	18	19	
10	18	18	8	13	17			13
20	18	18	15	13	18	10		15
40	20	18	20	13	13	10	10	15±
60	20	19	15	13	10			15±
80	20	18	15	13	13	8	10	14

TABLE 25.
VOGEL'S SCALE 3

Per cent. of phenolsulphone-phthalein	Tables of distilled water and urine						Averages
	3	5	11	15	20	22	
10	10	10	18	15			13
20	10	10	13	18	16	10	13
40	10	10	13	13	10	10	11±
60	10	10	13	10	10		11±
80	10	10	13	15	9	8	11±

In Table 24, Column 1, the dye was darker than in any other. Unfortunately two lots of dye had to be employed but the differences were not great.

TABLE 26.
VOGEL'S SCALE 2

Per cent. of phenolsulphone-phthalein	Tables of distilled water and urine					Averages
	6	7	12	16	23	
10	10	15	18			14+
20	10	15	13	9	10	11+
40	10	10	13	11	9	11-
60	5	5	13			8-
80	5	7	13	11	8	9

TABLE 27.
VOGEL'S SCALE 1

Per cent. of phenolsulphone-phthalein	Tables of distilled water and urine				Averages
	8	9	13	17	
10	20	20	13		17
20	10	15	13	10+	12
40	5	10	11	8	11
60	5	5	13		8-
80	5	5	8	7	6+

CONCLUSIONS

It is reasonable to draw conclusions from the foregoing studies because of the variety of tests employed, with careful checks and controls.

The first was the direct method whereby the

phenolsulphonephthalein was in exact tenths of a c. c. added to a litre of distilled water previously colored with Vogel's scale, 4, 3, 2 and 1 dye. This work is embraced in tables 1, 2, 3, 5, 6 and 8. These tests, shown in tables 4, 7 and 9, were controlled by the method of subdilution.

It again was desirable to check up the work by the direct method which consisted in injecting the phenolsulphonephthalein into distilled water and then adding the dyes to produce Vogel's Scales 4, 3, 2 and 1. These steps are shown in tables 10, 11, 12 and 13.

A still further control was introduced by the same method but starting with eighty per cent. of phenolsulphonephthalein, then diluting it with equal parts of water for forty per cent. and twenty per cent., correcting the dilution of the dye stuff by the appropriate quantity of Vogel's scale 4, 3, 2, 1. These tests are shown in tables 14, 15, 16 and 17. The urines were tested by exactly the same steps of direct methods and control methods. The details are shown in tables 18, 19, 20, 21, 22 and 23.

Allowing for differences due to variations in the dyes used and for weariness of the eyes after making many tests the résumé shown in tables 24, 25, 26 and 27 are very interesting. From these tables it is quite evident that in urines equivalent to Vogel's Scale 4 the average error is at least fifteen per cent., probably twenty per cent., with the darker urines.

With the Vogel's scale 3 the error is at least ten per cent. and in some circumstances may be nearly fifteen per cent. With Vogel's scales 2 and 1 the indicated error is about ten per cent. As previously stated the practical importance of these indicated errors is in the middle of the scale, by which are often decided doubtful cases.

I believe that in all the ordinary scale readings ten per cent. should be deducted for pale yellow, fifteen per cent. for positive yellow and twenty per cent. for urines with a reddish or orange tinge, in order to arrive at the absolute excretion, and thereafter decide in favor of or against operation.

ADDENDUM

Since the completion and reading of this paper the thought has occurred that a series of tables should be made using Cabot's method or its equivalent, namely bottles having the same quality of glass, diameter and capacity to contain both the control fluid and the artificially colored distilled water. The purpose of this last step was to eliminate any influence which the wedge shape of the test fluid in the colorimeters might have on the readings.

The details were the same as those adopted in the original paper. For the stock solution four c. c. of strong potassium hydrate solution were poured into a 1,000 c. c. beaker and brought up to full measure. Then with all preliminary precautions phenolsulphonephthalein was injected one tenth c. c. at a time ascending to one c. c. and thus creating a set of bottles for comparison beginning with ten per cent. and ending with one hundred per cent.

The test fluids Vogel's scale 4, 3, 2 and 1 were brought in the same way up to 1,000 c. c. and then one tenth, two tenths, four tenths, six tenths and eight tenths c. c. were injected, thus producing ten,

twenty, forty, sixty and eighty solutions. Bottles of the same size, thickness and quality of glass were then filled with these fluids and compared with the test bottles just described.

Absence of a sliding scale as provided in a colorimeter made it very difficult to estimate the exact color error. It may be said in general that this method supported and corroborated the other method. The tables speak for themselves.

TABLE 28.

VOGEL'S SCALE 4		REDDISH YELLOW		
A	B	C	D	E
Stock solution	Test fluid	Absolute per cent.	Indicated per cent.	Indicated error
1000 c.c. of distilled water, alkalinized with 15 per cent. sodium hydroxide with dye as stated below.	Fraction of 1 c.c. of dye in 1000 of distilled water alkalinized with 15% sodium hydroxide V. S. 4.	Injected into test fluid	By readings of the Heliger colorimeter.	
0.1	0.1	10	20	10
0.2	0.2	20	30-35	10-15
0.4	0.4	40	50-55	10-15
0.6	0.6	60	70-75	10-15
0.8	0.8	80	90-95	10-15

There may have been a little doubt in reading due to the fact that the dyes for producing the Vogel scale colors 4-3-2-1 were in these tests different from the dyes of the other series. The ten per cent. ascents in the scale of bottles also made graduation reading difficult.

TABLE 29

VOGEL'S SCALE 3		DEEP YELLOW		
A	B	C	D	E
Stock solution	Test fluid	Absolute per cent.	Indicated per cent.	Indicated error
1000 c.c. of distilled water, alkalinized with 15 per cent. sodium hydroxide with dye as stated below.	Fraction of 1 c.c. of dye in 1000 of distilled water alkalinized with 15% sodium hydroxide V. S. 3.	Injected into test fluid	By readings of the Heliger colorimeter.	
0.1	0.1	10	20+	10+
0.2	0.2	20	30+	10+
0.4	0.4	40	50+	10+
0.6	0.6	60	70+	10+
0.8	0.8	80	90+	10+

TABLE 30.

VOGEL'S SCALE 2		YELLOW		
A	B	C	D	E
Stock solution	Test fluid	Absolute per cent.	Indicated per cent.	Indicated error
1000 c.c. of distilled water, alkalinized with dye as stated below.	Fraction of 1 c.c. of dye in 1000 of distilled water alkalinized with 15% sodium hydroxide V. S. 2.	Injected into test fluid	By readings of the Heliger colorimeter.	
0.1	0.1	10	20±	10±
0.2	0.2	20	30±	10±
0.4	0.4	40	50±	10±
0.6	0.6	60	70±	10±
0.8	0.8	80	90±	10±

TABLE 31.

VOGEL'S SCALE 1		LIGHT YELLOW		
A	B	C	D	E
Stock solution	Test fluid	Absolute per cent.	Indicated per cent.	Indicated error
1000 c.c. of distilled water, alkalinized with 15 per cent. sodium hydroxide with dye as stated below.	Fraction of 1 c.c. of dye in 1000 of distilled water alkalinized with 15% sodium hydroxide V. S. 1.	Injected into test fluid	By readings of the Heliger colorimeter.	
0.1	0.1	10	20—	10—
0.2	0.2	20	30—	10—
0.4	0.4	40	50—	10—
0.6	0.6	60	70—	10—
0.8	0.8	80	90—	10—

There is much more thought and labor represented in this preliminary contribution than might appear to the average reader through the approved tables. If the result is the correction of doubt in those patients who perish even after a favorable phenolsulphonephthalein test the thought and the labor will have been immeasurably worth while.

REFERENCES.

1. PEDERSEN: Limitations of Functional Tests of the Kidneys, *Transactions American Urological Association*, 1915, ix, 374 to 388 inc.
2. *Ibid*, p. 378.

45 WEST NINTH STREET.

THE UREA OUTPUT AS A PRACTICAL KIDNEY FUNCTION TEST.

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In the present rather imperfect state of our knowledge regarding diseased conditions of the kidney, the information most necessary to secure, when a patient with chronic nephritis comes under our care, is: How much is the kidney damaged as regards its ability to get rid of the waste products of metabolism, and is the condition present essentially a progressive one or not? Or perhaps I would better explain my meaning by saying that we wish to know how much the damage to the kidney interferes with the permeability as regards the waste products or toxins of body metabolism which, if not passed out through the kidney, cause poisoning and ultimately death.

If in a coal-burning furnace where we use the greatest care to keep the grate free from clinkers, and with frequent shakings we can only get through a hodful of ashes in twenty-four hours, it is perfectly obvious that we must not put more coal on the fire than will produce a hodful of ashes in twenty-four hours; for if we do, the surplus ash accumulating day by day will ultimately choke the fire and put it out.

It seems to me that the knowledge that is vital, in order that we may prescribe a suitable diet and give a fairly accurate prognosis is what part of the waste products that should pass through, or be eliminated by, the healthy kidney cannot be fully eliminated by the kidney under consideration. This will give us an indication as to the amount of certain foods it is safe or advisable to allow our patient. Having procured an answer to this question, we must then limit the amount of exercise or activity to correspond to the amount of food that we find we can safely allow. To illustrate again by the furnace fire: If we find the grate is damaged, first find out how much ash we can get through the grate daily; secondly, put in only that amount of coal which, when burned, will produce that amount of ash; and, thirdly, try to heat only as much of the house as that amount of coal will heat and do not expect the furnace with a damaged grate (therefore a restriction as to the amount of ashes that can pass through) and consequently a restricted capacity, to burn coal to heat the same number of rooms that the furnace, when new, with a perfect grate would formerly heat.

First and foremost, I would say that if some foreign, innocuous substance, when injected into the body, will be eliminated by the kidney at a certain rate, it does not follow that the poisons from the waste of the body will be eliminated at the same rate. It must be understood that it depends on what part of the kidney is affected as to which of the various waste products may or may not be adequately eliminated. For instance, we are all familiar with conditions of the kidney, where the nitrogenous waste (urea) is freely passed through while, on the other hand, only very small amounts of sodium chloride are eliminated. In other cases of kidney damage, relatively small amounts of urea can pass through the kidney, while sodium chloride will pass freely; and there are other conditions where only relatively small amounts of either urea or sodium chloride will pass through.

What particular portions of the kidney are at fault when these various imperfect eliminations occur, I shall not discuss here, for this knowledge will not help us to formulate a better diet for our patient or to give a more correct prognosis; and besides this, I do not feel that the question is definitely settled as yet, but should be considered as theoretical rather than proved.

We know that the inability to properly eliminate salt by the kidney is usually an accompaniment of an acute disease, and the retention does not cause poisoning and death. On the other hand, we know that the retention of toxins which the kidney is unable to eliminate to the same degree as urea, causes a poisoning and ultimately death, if continued long enough.

It has been frequently stated by many medical writers that the amount of urea eliminated by the kidney has an absolute relation to the amount of nitrogenous food ingested. This is true, to a large extent, in health but in some conditions of pregnancy and in many conditions of a damaged kidney it is not true. Under these latter conditions the urea excreted may be much less than would be represented by the amount of nitrogenous food taken in, with a consequent retention of certain poisons in the system, and when this retention is continued long enough or in large amounts, death will ensue.

Therefore, it seems clear that in order to secure information as to the ability of the kidney to do the work which is vitally important, it is in many cases absolutely necessary to know just how much urea waste the kidney under discussion will eliminate in twenty-four hours, and not how much sodium chloride or phenolsulphonephthalein or any other substance can be eliminated unless the ability of the kidney to eliminate any of these substances is shown to be parallel to the elimination of the urea poison.

So far as we know at present, the ability of the kidney to filter out, or eliminate from the blood any known substance is not in many kidney conditions an exact measure of the kidney's ability to filter out or eliminate the urea poison. Therefore, because in most chronic kidney conditions the knowledge regarding the urea poison is the most vitally important thing for us to discover, it stands to reason that in these conditions, the ability to filter

out or eliminate some foreign substance is of little benefit to us as far as increasing our knowledge as to what is the best and safest food, also the proper amount, for our patient, and in aiding us to give a fairly accurate prognosis.

As far as my experience goes, there is at present no one of the so-called function tests that will give us the needed information in all cases of damaged kidney, and the particular cases in which tests fail are the very ones in which the information we seek through the test is vitally necessary in order that we may successfully advise our patient as to the quality and amount of diet, and as to exercise.

In order to illustrate my meaning more fully, I will quote briefly from several cases:

CASE I.—The patient had been a semiinvalid for several years, and had consulted several physicians. Two weeks before I saw her, her urine had been examined and something had been injected into her arm and her urine collected through a catheter for two hours. After this her husband had been assured that there was no serious kidney condition present, and she was allowed an unrestricted diet. One year ago she had weighed 132 pounds; now she weighs 120 pounds; was sleeping well; in fact, was rather doxy and drowsed a lot. The blood pressure was 170 systolic, 110 diastolic, pulse pressure 60. Her heart was regular, not enlarged but somewhat weak, and the patient was slightly listless. She did not have a good appetite, but had been eating meat or eggs at least twice a day, with two glasses of milk. She was placed on the following diet:

Breakfast.—Melon, cereal and cream, tea, half slice toast, little butter.
Dinner.—Soup (thin), string beans, baked potato, pear, and some grapes.
Supper.—Melon, puffed rice with cream, soup (thin), roll and butter, half an apple.

Of course the diet was varied from day to day by such substitutes as a peach for the pear, and we will call it her basic diet. She had previously been on a diet containing meat, eggs, and milk daily.

Day	Output Urine	Total Solids	Urea	Diet
1st	1597 c.c.	24.	15.	basic
2nd	1863 c.c.	23.6	13.6	basic
3rd	1800 c.c.	26.	11.6	basic
4th*	1810 c.c.	30.	13.	basic+1 egg+steak+fish
5th	1600 c.c.	22.	14.9	basic
6th	1744 c.c.	23.	14.	basic
7th	1774 c.c.	21.	11.	basic
8th	1600 c.c.	22.	11.2	basic+fish
9th	2012 c.c.	23.	14.	basic
10th**	1900 c.c.	22.	11.3	basic
11th	2050 c.c.	27.	14.	basic+2 eggs, steak, lamb
12th	2000 c.c.	28.	16.	basic
13th	2010 c.c.	27.	14.	basic
14th	2000 c.c.	26.	11.	basic
15th	1900 c.c.	25.	11.2	basic

*On this day, said she did not sleep as well as formerly, and when questioned, said she slept all right at night, but did not care to have her usual nap in her chair during the forenoon. She did not take another nap during the day until the twelfth day, when she slept an hour in her chair during the morning.

**On this day, was given injection in the thigh of phenothaline and the catheter was placed in her bladder; reaction in nine minutes.

It will be noticed that when the patient was placed on the low nitrogenous diet called her basic diet following a diet high in nitrogen, the urea output fell daily for three days. A significant symptom was the fact that after four days of this low nitrogen diet, the patient complained of not sleeping as well as usual, but on inquiry it developed that she slept as well as usual at night; but did not feel sleepy enough to have a nap in her chair during

the morning as she had done for months. On the fourth day there was added to her basic diet an egg for breakfast, a piece of steak for dinner, and some fish for supper. During this twenty-four hours she eliminated thirteen grams of urea, but during the following twenty-four hours, when she had returned to her basic diet, she eliminated fourteen and nine tenths grams of urea, and during the following twenty-four hours, while still on a basic diet, fourteen grams. It was not until the fourth twenty-four hour period after she had received the extra amounts of nitrogenous food that her urea output returned to normal, about eleven grams.

On the eighth day, in addition to her basic diet, she had fish at two meals (at supper, however, she only took a very small amount), returning the next day to her basic diet. During that twenty-four hours she only passed eleven and two tenths grams of urea, the second day fourteen grams, and the third day she had eleven and three tenths grams of urea, the normal output. On the next day, the eleventh day, she was given (in addition to her regular diet) two eggs for breakfast, a piece of steak for lunch, and a piece of roast lamb at supper. During that twenty-four hours she passed fourteen grams of urea. The twelfth day on basic diet she passed sixteen grams of urea, the thirteenth day fourteen grams, and the fourteenth day eleven grams, a normal amount, thus showing that it took three days for the system to get rid of the great excess of waste material, and that the system could not pass much over fifteen grams a day.

Following this, she was sent home and placed on the following diet:

Breakfast.—Fruit, half an egg, small amount of cereal and cream, (mostly top of bottle) weak coffee.
Lunch.—Four ounces soup (any kind), two vegetables, bread and butter as wanted, a glass of milk.
Supper.—Two vegetables, bread or cracker, cheese, baked apple or a sweet dessert.
Bedtime.—Fruit.

The analysis at various intervals follows:

	Output Urine	Total Solids	Urea
After 3 days	2050	24	12
After 6 days	1750	28	12.2
After 1 week	2000	28	12
After 1 month	1500	25	14

The patient had gained four pounds. Weight 119½ pounds. Blood pressure unchanged. Said she felt better than she had for years. It was deemed advisable to send this patient to a warm climate where she could be outdoors more than it seemed best for her to do in a New England winter, and where the added excretory action of the skin would help relieve the kidney.

While in the South, a local physician was consulted in relation to a slight diarrhea. Later he decided she did not have a damaged kidney, and advised her to go to a large hospital for observation. The patient followed the advice, and was admitted as a patient for observation. Three days later, following various tests, one of which was an injection in the arm and collecting the urine for four hours by catheter, her husband was told that her kidneys were working properly, and that she needed a much more nourishing diet in order to build her up. She was then given three eggs a day, one quarter pound of meat, and a pint of milk, besides vegetables. After six days on the new diet, she was found by the nurse one morning to

be nearly unconscious; within six hours she became comatose, and twelve hours later, died in coma (uremia?).

CASE II.—This patient, briefly gave a history that for several years he had had slight dyspnea on exertion. One year ago, there was sudden loss of sight in one eye, which gradually improved. No other symptoms except that he had lost about fifteen pounds in three months. One month ago, he had suddenly lost consciousness; no convulsions; consciousness slowly returned in about ten hours. This attack occurred following two days when the thermometer was below zero.

He came under my care with the following analysis: 2,130 c. c., slightly pale color; specific gravity, 1,009. Total solids forty-three grams. Urea twenty-one grams; very slight trace albumin; many hyaline and granular casts, numerous renal cells. Heart strong, regular; apex beat two inches outside nipple line. He was placed on a diet as follows:

Breakfast.—One half grapefruit or an orange, toast or biscuit and butter, cereal and cream with sugar.

Dinner.—Bread, any cereal, any dessert.

Supper.—Any vegetable, any vegetable or fruit salad, baked apple and cream and sugar.

Two glasses milk during twenty-four hours.

This continued for five days; on the sixth was added a dropped egg at breakfast, one glass of milk at 10 a. m. Dinner, a large portion of turkey. Supper, custard containing two eggs. Bedtime, a glass of milk; seventh day, return to previous diet; ninth day, discontinue the milk; eleventh day, diet to consist only of cereals, fruits and vegetables.

Day	Output Urine c.c.	Total Solids	Urea	Diet
1	830	25.	12.4	basic (part of this urine was lost)
2	1180	43.8	18.8	basic
3	1240	55.	16.	basic
4	1120	44.	15.6	basic
5	1660	61.	19.9	basic
6	1360	76.	23.	extra nitrogen
7	1720	64.	20.6	basic
8	1570	54.7	18.8	basic
9	1660	61.7	21.5	basic minus milk
10	1480	72.	19.2	
11			14.	only cereals, fruits and vegetables
12	1840	63.	16.	
13	950	55.	17.1	

Creatinin content of blood=.3 per 100 c.c.

On the tenth day, phenolsulphonophthalein was injected, and the catheter showed reaction in fifteen minutes. This patient apparently could pass a moderate amount of urea through the kidney, and was given a home diet as follows:

Breakfast.—Fruit, egg, bread, coffee and cream.

Dinner.—Soup (milk, corn or potato), any vegetable, bread, and a dessert containing one egg.

Supper.—Any vegetable, bread and butter, cheese, olives or baked apple.

Two weeks after leaving the hospital, analysis showed 1,892 c. c., slightly pale, acid, specific gravity 1,011, total solids 49, urea 17, albumin trace +. A few fine granular casts small amount of free fat.

About one week after this he became unconscious, with the following history. The weather had been extremely cold for several days; the patient got up as usual at 6 a. m. He ate breakfast at 7:30 and put on his overcoat and hat and went to his office at 9 (five minutes' walk). He went to his desk, and began work. Soon the janitor came in, and failing to get intelligent replies to questions, began to observe him carefully. In about ten minutes the patient arose from his chair and fell to the floor. He was taken in an ambulance to the hospital, and about four hours later would put

out his tongue when sharply ordered to do so, and in twelve hours would answer questions; in twenty-four hours he was apparently normal mentally, except that he could not remember any of the happenings. The next day, by careful questioning, he could remember having eaten breakfast before the attack, but could not recall what he had eaten, and had no recollection of anything after breakfast until he realized he was in a hospital about eight hours later. He remained in a hospital until he went to Florida, where he was getting on nicely until he had a cerebral hemorrhage, and died in twelve hours.

In this case, while the food test showed that the excretion of urea was only slightly delayed after the ingestion of nitrogenous food the phenolsulphonophthalein test showed a marked delay. It was therefore considered advisable to give the patient a sufficient amount of nitrogenous food and to allow a fair amount of exercise.

CASE III.—This patient was a woman, aged forty-six years, the menopause passed. Five years ago, felt tired most of the time, and was examined by a physician, who said she had nephritis. She has been on a restricted diet as regards meat since that time. She has slight dyspnea on exertion, and tires easily; digestion good; headaches very rare. No excess of urine at night; specific gravity low for several years. Sleeps well, but dreams a great deal. Feels tired when she awakes, but by nine o'clock feels better. Blood pressure systolic 120, diastolic 85, pulse pressure 35. Heart in good condition. Weight, 160 pounds.

Analysis of five years previously showed 1,300 c. c. pale, specific gravity 1011, urea thirteen grams, very slight trace of albumin; rare hyaline casts. Four years previously, 1,655 c. c. pale, 1006 specific gravity, urea eleven grams, very slight trace albumin. First, previous to examination, urine showed 1,400 c. c. yellow, acid, 1010 specific gravity thirty-three grams solids, nine grams urea; slightest possible trace of albumin; occasional hyaline cast. She was placed on the following diet:

Breakfast.—Toast and butter, weak coffee and cream.

Dinner.—Potatoes, string beans, or peas, or asparagus, berries and cream for dessert, water.

Supper.—Bread, any vegetable salad, any of the following vegetables: beans, peas, asparagus, beets, or squash, and any fruit.

This will be called her basic diet.

Day	Output Urine c.c.	Total Solids	Urea	Diet
1	1450	20.	11.5	basic
2	1537	28.7	12.3	basic
3	1242	29.	16.	basic + 2 eggs + 3 glasses milk, steak and 2 chops.
4	1537	43.	24.6	basic + 2 eggs + 3 glasses milk, steak and 2 chops
5	1714	41.	19.5	basic
6	1361	26.	12.	basic
7	1301	27.	12.	basic (took excessive exercise)
8	1420	33.	11.1	basic
9	780	23.	11.	basic (very hot day, 100-mile auto ride)
10	769	53.	20.	basic + 5 eggs
11	lost			lost
12	1124	26.	10.	basic
13	1242	38.	16.1	basic + 1 glass milk, 3 eggs, ¼ lb. cheese
14	1200	29.	11.4	basic

Phenolsulphonophthalein injected showed reaction in sixteen minutes; first hour, twenty-two per cent.; second hour, fifteen per cent.

In this case I wished to find out if excessive exercise or long auto rides had any deleterious effects on the kidney output. As will be seen, no such effects were apparent. From the rapidity with which the urea was eliminated after the ingestion

of an extra amount, it was felt that the patient had been on a too restricted diet, and had taken too much exercise, considering the restricted diet. She was, therefore, sent home and placed on the following diet: Basic plus an egg for breakfast; a glass of milk at 10 a. m.; an egg in dessert at dinner; considerable cheese at supper.

Two weeks later she reported; weight, 165 pounds. Was feeling better than for several years. Urine analysis, 1,892 c. c., color slightly pale, specific gravity 1009, solids 40 grams, urea 17 grams, very slight trace albumin, rare hyaline casts. Blood pressure, diastolic 120, systolic 75; pulse pressure 45. Two months later she was feeling very well, and her family reported that she had more energy than for years. The urine showed 2,012 c. c., color pale specific gravity 1009, 42 grams solids, 20 grams urea, slightest possible trace albumin, rare hyaline casts. Weight 166½ pounds. Ten months later she was compelled to undergo a considerable physical strain for two weeks, but without undue fatigue, and showed 946 c. c., color normal, specific gravity 1018, solids 40 grams, urea 21 grams, slightest possible trace of albumin. No casts.

I shall not quote from any more cases, as I feel that these typical cases are sufficient to illustrate my points. In the first, the patient showed an inability to pass more than about sixteen grams of urea daily through the kidney. The phenolsulphonophthalein test (catheter in bladder) showed a reaction in nine minutes. When placed on a diet not making more than twelve to fourteen grams of urea daily, and very limited exercise, she gained in weight and strength; but when placed by another physician on a highly nitrogenous diet for a week in order to build her up, coma developed and death followed (uremia?).

The second patient had a contracted kidney, but was able to pass ordinary amounts of urea. The phenolsulphonophthalein test showed reaction in fifteen minutes. He was allowed in his diet enough milk and eggs to have an output of fifteen to twenty grams of urea daily, and was doing well until a cerebral hemorrhage caused death.

The third patient had been on a very nitrogenous restricted diet for several years, and was very active, but easily tired. The food test showed she could pass much more nitrogenous waste (urea) than her diet contained. The phenolsulphonophthalein showed a reaction in sixteen minutes. She was given more nitrogenous food, and has been better and has felt better than for several years.

CONCLUSIONS.

The ability of the kidney to pass off the waste products of metabolism is not, in many cases, shown by any of the so-called kidney function tests.

The ability of the kidney to pass off the dangerous waste products of metabolism is easily discovered by means of feeding definite amounts of nitrogenous food to a person previously put on a so-called basic diet and watching the output of urea.

Having this knowledge, the diet can then be built up so that the person takes the maximum amount of nitrogenous food, the waste from which his kidneys can get rid of, and then his exercise must be limited to correspond to his prescribed diet.

SURGERY OF THE PROSTATE.*

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Glancing at the historical chapters of Deaver (1) and of F. S. Watson (2) one is amazed at the vicissitudes of fortune undergone by the offending prostate. It has been tunnelled, compressed, crushed, twisted, cooked, excised, enucleated, electrified and punched either *per urethram*, perineally, or suprapubically. Since it first assumed surgical importance it has created difference of opinion as to the etiology of its enlargement, the anatomy of its component parts its physiology, pathology, and the proper method of removing it.

Varied as well as numerous have been the theories regarding the pathogenesis of the enlarged prostate, hence a multiplicity of statements somewhat confusing, for instance: "All are agreed that the true hyperplasia of the gland elements is not the result of inflammation. On the other hand, it is the writer's belief that many of the deformities of the prostate where there is no true cytoplasia are the results of inflammation" (Pilcher) (3). "The evidence derived from the more recent pathological studies of the prostate gland points somewhat to the dependence of this condition upon chronic inflammation, etc." (White and Martin) (4). . . . And then these authors exhibit the arguments against the inflammation theory. Ciechanowski (5) alleges that prostatism, whether adenomatous or sclerotic, is essentially the same; that it is due to obscure, inflammatory processes originating in the stroma of the gland, etc. . . . And Keyes (5), not being in sympathy with this view, thinks that we should accept the theory that the adenomatous changes are due to a neoplastic process and that the sclerotic changes are the results of inflammation. Ramon Guiteras (6) accepted the theory of the French school that "So-called hypertrophy of the prostate is benign neoplasm."

Then there is the arteriosclerosis theory (Guyon and Launois) (7), which was apparently ousted by the theory of Casper and Motz (8). Velpeau's (9) fibromyoma and White's (10) sexual senility theories have also had their advocates. Hawley (11) believes that altered prostatic secretion is the cause of the enlargement. Even the view that prostatic hypertrophy is essentially a senile change has been opposed. (Bangs) (12). Perverted action of the testes, pelvic congestion and sexual excesses have been cited as causes, but little is known about the etiology of simple prostatic hypertrophy.

Lowsley (13) has clarified the question of the lobes of the prostate, having shown that this gland develops from five separate buds. Physiologists as yet have not agreed upon the mechanism of micturition and hence some writers maintain that the prostate is concerned in this act and others (notably Keyes) (14) assert that the prostate has nothing to do with urination.

*Read before the St. Joseph's Hospital Clinical Conference February 10, 1920.

Of the many classifications of benign enlargements of the prostate that of Pilcher (15) seems the least involved. I quote it in full: "Excluding syphilis, tuberculosis and cancerous lesions of the prostate, the noninflammatory enlargements of the prostate are either cytological or mechanical, viz: 1. Cytological hyperplasia, a, of the parenchyma, b, of the stroma, c. of both; 2, mechanical—due to retention of gland contents with cystic dilatation. In addition to this we have deformities in and about the prostate due to inflammation and irregularities of development of accessory glands which cause symptoms similar to hypertrophy of the prostate."

As to the manner of removing the prostate, it is becoming more and more apparent that the surgeon must use a method to fit the case and not try to make the case fit the method. While the suprapubic operation has given wonderful results in the hands of its masterful exponent, Freyer (16), and while the perineal method, when performed by its most able advocate, Young (17), has shown a surprisingly low mortality, yet the surgeon who limits himself to either method exclusively cannot help, sooner or later, doing an injustice to his patient. If the operation has not been selected with due regard to the position and size of the enlarged gland, incontinence of urine or rectourethral fistula may follow either method. The small fibrous gland should not be removed suprapubically; the large, soft gland which projects into the bladder ought to be removed suprapubically. If the abdomen is thick and the bladder small the perineal is the safer method. When the gland is not palpable *per rectum*, but presents symptoms and is demonstrably enlarged when seen through the cystoscope, the suprapubic is the better method. John H. Cunningham (18) believes that "Those professing to be expert in prostatic surgery should possess a skill in performing the different proved operations and should have the ability to select the most appropriate operation for the individual, not employing a single operative technic for all patients." J. Chalmers DaCosta (19) says, "No one routine plan is suitable in all cases. The patient should be studied, and the operation chosen which is safest and best for that individual patient. The surgeon who uses one method only must wrong many patients, and he retains consistency at the expense of humanity."

Young's (20) punch operation, originally recommended for obstruction of the vesical neck by medium bar (Randall) (21), sclerosis of the vesical neck and intravesical or intraurethral isolated prostatic lobules, should be limited, according to Braasch (22), "to cases in which the superficial medium tissues obstruct the vesical orifice, and to occasional cases of involvement of the bilateral lobes in which enucleation is otherwise inadvisable." According to Judd (23), it is an operation which requires considerable skill. It may be followed by bleeding and may necessitate subsequent operations.

Prostatotomy by means of the Bottini (24) or Chetwood (25) method should be employed in such aged and enfeebled subjects as can neither endure catheter life nor submit to a prostatectomy. There is an element of uncertainty about the Bottini operation, which will always retard its popularity among general surgeons who, as a class, prefer to

see what they are doing. Binnie (26) tells us that he saw one patient who had been operated upon by the Bottini method by a surgeon of great experience in this class of work, and that the patient's urethra had been burned and partly obliterated while the prostate had escaped cauterization. Bouffleur (27) performs a galvanocautery operation through a suprapubic cystotomy incision, the actual cautery having been heated to a white heat; and small median lobe enlargements of the prostate have been treated successfully through the cystoscope by means of the Oudin current.

The most important phase of the question of prostatic surgery is the proper selection of cases for operation. With the exception of the case of absolute retention which cannot be catheterized—and which may be treated by making a very small suprapubic opening into the bladder in order to allow gradual drainage through a female, selfretaining catheter (28)—there is always ample time for the careful study of cases of prostatism.

It is important, first of all, to make a diagnosis. When a patient of middle age or over complains of nocturnal irregularities of urination, one should think of hypertrophy of the prostate, urethral stricture and cancer of the prostate. While the presence or absence of stricture usually can be determined by careful investigation, it is often most difficult to separate prostatism plain from prostatism associated with carcinoma. Of course, if the carcinoma has extended beyond the limits of the gland—a hopeless state in which diagnosis is too late to be of much service—a rectal examination will reveal the growth. Small nodes in the prostate may mean tuberculosis, cancer or chronic prostatitis—or, if in the lateral lobes, perhaps stone. In such cases x ray examinations should be made, or it may be helpful to introduce a sound into the urethra during rectal palpation. It may be impossible to use either sound or cystoscope, and the latter may give no information, even when employed in such cases. If, with symptoms of prostatism, there are sciatica, pelvic pain or tumor of bone or in the abdomen, cancer of the prostate may be suspected (29). Bleeding is more frequent in simple hypertrophy than in carcinoma. Growths within the bladder may be differentiated by cystoscopic examination. Besides rectal touch, the abdomen should be palpated, the urine examined, the residual urine estimated and the length of the urethra measured. The passage of a catheter should be extremely gentle and guarded by rigid local antiseptics and the administration of hexamethylenamine—and in spite of all of these precautions, if infection does not already exist, it will usually follow the regular employment of the catheter. The cystoscope, if the urethra will tolerate its passage, will reveal stone and often afford information as to the shape and size of the prostate.

In these cases it is essential to possess information about the functional capacity of the kidneys, and, of the various tests devised for this purpose, the indigo carmin and the phenolsulphonaphthalein methods are perhaps the most practical. The indigo carmin method was introduced by Voelcker (30) and Joseph and is used in this country extensively by B. A. Thomas (31). Ira Remsen (32) was the first to make phenolsulphonaphthalein

and Rowntree and Geraghty (33) introduced this method of testing for the functional capacity of the kidneys. Of the experimental polyuria test of Albarran (34), Keyes (35) states that "its accuracy by no means compensates for the length of time consumed."

A twenty-four hours' specimen of urine should be collected. If the total quantity is between 1000 c.c. and 2000 c.c., it may be considered for all practical purposes a normal output. Oliguria and polyuria are significant of so many conditions, surgical or otherwise, that either symptom is only important when accompanied by other pathognomonic signs.

Oliguria may occur when there has been a lessening of intake of water, the intake in a water balance being water taken in as such, the watery contents of foods (vegetables, milk, etc.) and oxidation water from the oxidation of the hydrogen of fats, carbohydrates and proteins during metabolism (Barber) (36). Oliguria may be due to excessive perspiration, constant vomiting, or severe diarrhea (cholera, exophthalmic goitre). It may be the result of passive congestion of the kidney, the result of myocardial insufficiency. It may follow pressure on the renal veins by tumors or collections of fluid in the abdomen. Oliguria may be observed during the formation of edema and transudates. It may be caused by spasm of the renal arteries or arterioles as a result of acute strychnine poisoning. It occurs in gout, fevers, acute nephritis and in chronic parenchymatous nephritis. If oliguria occurs in chronic interstitial nephritis it is a danger signal of oncoming uremia. If it is accompanied by cylindruria, albumin and blood, it is a sign of organic renal disease—usually glomerulonephritis. Oliguria may mean serious impairment of kidney function, acute Bright's disease or obstruction to the outflow of the urine.

Polyuria may be due to increased circulation through the kidneys, to a watery composition of the blood or to an increase in the secretory activity of the kidney following the consumption of large quantities of liquid. Polyuria may follow the restoration of compensation in cardiac failure or in renal incompetency. It may appear during convalescence from typhoid and other fevers and while edemas and exudates are disappearing. It may be due to certain salts or drugs (sodium chloride, the caffeine group, digitalis, etc.). Polyuria may exist when there are lesions of the central nervous system, when there is injury to the floor of the fourth ventricle, in puncture of the medulla and when there is tumor anywhere in the brain. Polyuria is present in hypopituitarism and follows section of the splanchnic nerves. Cushing (37) has shown that subcortical transplantation of the posterior lobe of the hypophysis may cause polyuria. A polyuria which persists with urine of low specific gravity usually means contracted kidney or diabetes insipidus; if associated with high specific gravity we should think of diabetes mellitus. Polyuria occurs in amyloid disease of the kidney and in pyelitis. There may be a transitory (vasomotor) polyuria in migraine, epilepsy or hysteria. Polyuria occurs when there is chronic renal congestion, as in stone, prostatism, tuberculosis and retention. From all of

which it might be concluded that either oliguria or polyuria means nothing as an isolated symptom.

The specific gravity of the urine should be carefully noted in these cases of enlarged prostate. Deaver (38) states that he will not operate if the specific gravity of the urine continues below 1005.

The urea of the twenty four hours' specimen should be investigated because while absence of urea concentration in the urine does not of itself prove that there is a diseased kidney, the presence of such concentration is a sign of a healthy kidney.

A determination of the amount of nonprotein nitrogen in the blood should be made but it is of little value, as Frank (39) states, unless one is aware of the nitrogen intake. In his most interesting paper, Frank calls attention to the advent of an era of physiological surgeons the advance guard of whom have been the investigators of such vital questions as shock, acidosis and renal function. He feels, as do many others, that some of the physiological studies, which in the past have been applied to urology almost exclusively, should now take a prominent place in general operative surgery. All of Frank's conclusions are not established or beyond debate but they constitute a step in the right direction—the reduction of operative mortality—and they should be accepted or rejected after careful trial. The prostatic patient's genitourinary tract should be submitted to careful x ray examination in which it may or may not be necessary to catheterize the ureters.

In the differential diagnosis of prostatic conditions perhaps nothing is more puzzling than when the surgeon examines a sufferer from retention of urine with no palpable enlargement of his gland and with no stricture. In such a case the patient may have carcinoma and perhaps have nodules or an indurated posterior lobe; he may have a pedunculated middle lobe or bar which will show through the cystoscope; or the bladder may be paralyzed. If the bladder is paralyzed cystoscopic and urethroscopic examination may show typical trabeculation and perhaps some relaxation of the sphincters; rectal examination will be either negative or reveal a prostate which seems smaller than normal and is surrounded by flabby tissues (40); the cerebrospinal fluid will probably be positive to the Wassermann test; and perhaps there will be lessening or absence of deep muscular sensation. Judd and Braasch (40) state that in these tabetics "when it is evident that the sphincter itself is not relaxed, [and this may be noted through the cystoscope, J. F. X. J.] that there is sufficient hypertrophy of the prostate to account for the urinary obstruction, and that the general condition is favorable, then prostatectomy may be attempted." Young (41) has also operated under similar circumstances. Keyes (42) is not hopeful about operative cures in these conditions.

Rarely, fortunately, there is a condition, encountered in younger men, which is negative to rectal and cystoscopic examination and yet in which there is prostatic sclerosis. Tabes must be carefully excluded before making such a diagnosis (43). Judd (44) "believes that many of the patients with prostatic trouble, who continue to have the so-called cystitis and residual urine after the obstruction has

been removed, are in reality suffering from diverticula, and that if a careful examination is made for a diverticulum at the time of the prostatectomy in such cases this error will be avoided."

It is somewhat trite, perhaps, to say that a general and thorough physical examination should be made in addition to the urological investigations. If the surgeon can no longer trust his ear as far as hearts and lungs are concerned—which is often the case—his colleague, the internist, should be called in to permit the patient to benefit by such consultation. No prostatic (nor any other surgical case, except an emergency) should be given a general anesthesia while he has bronchitis. It is seldom, if ever, necessary to submit a case of prostatism to operation during an epidemic of influenza or of any other infectious disease. Low kidney function, heart disease with failing or absent compensation, high blood pressure, arteriosclerosis, infection anywhere in the genitourinary system, are some of the conditions which may absolutely contraindicate operation and they all will require the most careful preoperative treatment—even should operation be decided upon. We ought to be on the watch for acidosis always.

Acting on the acknowledged fact that prostatic patients, who have cystitis and other evidence of chronic infection at the time of operation, usually fare better than those who have no symptoms of infection, Judd (45) tried the use of a colon bacillus in order to modify infection in prostatectomies. His results were suggestive only but the idea should be acted upon and worked out on a large scale before drawing any conclusions. Cultures of the urine should be made in all cases of prostatism.

Preoperative drainage of the bladder ought to be effected—through the urethra, if this is possible, otherwise suprapubically—until the patient's local and general conditions warrant prostatectomy. Preliminary suprapubic drainage adds to the difficulty of the subsequent prostatectomy and, if the urethra permits of it, preoperative drainage should be conducted through the urethra. Fréyer (46) was obliged to perform the two stage operation seventy-two times only in a total of 1,550 suprapubic prostatectomies. He believes that preliminary suprapubic drainage should be effected in those cases where the bladder is badly infected, perhaps containing phosphatic stones and especially if the kidneys are involved as manifested by chills and fever, emaciation and debility and when the patient has very frequent, painless urination due to an overdistended bladder—no catheter having previously been used—and with this condition, incipient signs of uremia. In the latter case Freyer drains the bladder slowly by means of a retained catheter and a few days later does a suprapubic cystostomy. Then, in about two weeks, when the kidneys have regained normal function, he enucleates the prostate. Freyer says that it is much more difficult to remove the prostate ten days or longer after preliminary cystostomy because of increased rigidity of the tissues about the incision. Judd (23) believes that it is difficult to do an accurate operation after the bladder has been opened and drained, and a sinus has persisted for some time and that if this preliminary opening be enlarged the adjoining tissues are immediately exposed to infection. Deaver (47) thinks that it is

dangerous to enlarge the incision of a preliminary suprapubic cystostomy because of the risk of opening into the peritoneal cavity, the peritoneum having become attached to the bladder wall in the line of the original incision.

If the retained catheter is employed during the preoperative treatment of prostatism, it must be remembered that there is a well established nervous relation between the deep urethra and the secretory apparatus of the kidney (Pilcher) (48), and that anuria may result directly from the irritation of the deep urethra by the catheter. Here, obviously, the preoperative drainage must be suprapubic.

In addition to the drainage tube in the bladder, after suprapubic prostatectomy, a cigarette drain should be placed in the prevesical space—indeed, Judd's (23) suggestion to use Dakin's solution and Carrel technic in the space of Retzius seems a sound one. The same surgeon (23) does not believe in irrigation until after the first day following operation. Irrigation immediately after suprapubic prostatectomy prolongs oozing. Rockey (49) thinks that irrigation after prostatectomy is a surgical error. "It promotes the continuance of bleeding, devitalizes the freshly exposed tissues, and favors the formation of sloughs by removing the blood which is the natural hemostatic and protective of the wound."

The mortality of prostatectomy in the hands of the average general surgeon has been in the neighborhood of fifty per cent. The reduction of this mortality will depend upon:

1. Intimate association of the internist, physiologist and the laboratory man with the surgeon in the study of the case.
2. Thorough examination of the patient by one skilled in physical diagnosis—particular stress being laid upon the lungs, heart, arteries, kidneys and nervous system.
3. Complete investigation of the blood and urine by a competent laboratory man. If it gives the slightest promise of reducing the death rate, no test, functional or otherwise, should be considered by the surgeon too fantastic to merit trial.
4. Willingness and ability on the part of the surgeon to adapt his methods to the special requirements of each case—irrespective of the fact that he has rejoiced in the performance of a certain technic heretofore.

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103 SOUTH TWENTY-FIRST STREET.

THE TREATMENT OF SPECIFIC URETHRITIS.

A Simple Technic.

BY ROBERT H. McNAIR, M. D.,
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Almost every practitioner, whether specialist in urology or not, is doubtless aware of the fact that nitrate of silver comes nearest to being a specific against the gonococci than any other agent employed. Yet after much experimentation with various strengths of silver solution, I have come to the conclusion that the secret of a successful treatment of gonorrheal infection, especially during the first few weeks of its course, is to be found in determining the right strength of solution to apply in individual cases. In other words, it is very essential to find out definitely the strength of solution which may be safely used without inducing harmful reactionary irritation to the delicate mucous membrane already injured, and causing a greater degree of epithelial exfoliation, hence rendering the inflammatory area more favorable for the micro-organism to flourish and continue active destruction.

It is impossible to inundate completely and destroy the active germs with one free irrigation, therefore the application of the remedy must be repeated often and carefully.

I think the simple technic that has been repeatedly and quite successfully employed may be best described by citing a few typical cases of gonorrheal urethritis. Several of the patients complained of having suffered from painful nocturnal erection and troublesome chordee.

CASE I.—T. P. C., aged twenty-eight, a railroad employee, was first seen early in March of the present year, with a history of nearly five weeks' duration of free discharge and much discomfort. The patient had consulted several physicians and as many druggists. This case was one of troublesome chordee. The treatment was instituted with one half of one per cent. silver nitrate solution, after the urethra had been carefully flushed with a sterilized irrigating fluid. Thus the silver solution was gently and carefully instilled into the urethra—rather than injected by means of a properly shaped pipette.

The rubber bulb at the base of the glass instillator was quite strong enough to deliver the solution. The long, tapering neck, or nozzle, of the instillator was almost as long as an average index finger, with a smoothly turned end, so that there could be no possible danger of injury to the inflamed mucous membrane. The solution is simply sucked up into the pipette, gently inserted to the full length of the nozzle into the urethra, and the contents delivered. Several syringefuls, are used at each sitting.

This patient received just fourteen treatments, in as many consecutive days, during which period the strength of solution was gradually increased up to one and a half per cent. At the expiration of the period of daily application, the discharge had disappeared, and within a few days more there were no clap strings in the urine. After repeated tests

the patient was discharged and has remained so. Several more railroad employees subsequently came to me and were good patients.

CASE II.—On April 10, 1920, J. G., twenty-two years of age, employed by a furniture company, was referred to me for treatment. There was a free gonorrheal discharge with accompanying symptoms of the infection, subacute in character. Painful erections and chordee were complained of. This patient had also received treatment with astringent injections and capsules internally. Practically the same course of treatment was pursued, only the silver strength was increased to two per cent. solution. The discharge subsided in two weeks. Clap strings disappeared from the urine within the following week and the patient was discharged cured in just three weeks from the date of first treatment.

CASE III.—J. G. B., twenty-five years of age, a grocery clerk. History given was of a free discharge, considerable pain and swelling, that had lasted a little less than three weeks. Treatment at drug stores had been by capsules only. The patient was treated each evening, beginning with half of one per cent. silver solution, and gradually increasing the strength to two per cent.

It may be appropriate to remark here that the increase of the strength of the solution was determined by the degree of after irritation caused by the application. It has been found that in most cases the urethra will rapidly become quite tolerant to the irritating effect of silver if it is applied in gradually increasing strength and in a small quantity at a time.

The discharge had completely disappeared in this latter case after two and a half weeks of daily treatment. The two glass urine test was made for clap strings during one more week and the patient was discharged cured; there has been no further trouble. Other similar cases might be cited, but would only repeat what has been said, hence consume time and space unnecessarily. Silver properly applied is the remedy *par excellence* for specific urethritis.

THE CLINICAL STATUS OF GONORRHEA.

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AND

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Having reflected upon the respectable antiquity of gonorrhea, and the voluminous mass of literature extant thereupon, one might wonder what could remain to be said upon this commonplace subject. Nevertheless, gonorrheal infection still remains a glaring social evil; not because the treatment is unsatisfactory, but because many cases are unsatisfactorily treated. In attestation of this, witness the ever large number of cases of lingering, but nevertheless curable, infection; the serious complications, usually preventable, genital, extragenital, and metastatic; the countless sufferers from pyosalpinx who flock to the gynecologist. What, then, is the reason for these grave and distressing conse-

quences? In answer to this query, we repeat our assertion: It is not because the treatment is unsatisfactory but because many cases are unsatisfactorily treated. And there are various reasons for this.

First and foremost, there still exist a not inconsiderable number of practitioners who, through superficiality or prejudice, adhere to the absurd dictum of Noeggerath: "Once a gonorrheic, always a gonorrheic; once infected, always infectious." Again there are others, and their number is not small, who, from inherent aversion, will not themselves treat such cases conscientiously, possibly not at all, and do not encourage the patients to seek proper treatment at the hands of those who are willing and competent; and still others who fail to estimate the extent and gravity of the infection, and consequently apply inadequate and improper treatment. What, therefore, is to be said and done?

Gonorrhea is a perfectly and permanently curable disease. What are the essentials to the attainment of this end? We believe that the answer may be tersely stated in three words, spirit, ability, equipment. Without an adequate armamentarium and the ability to employ it, and without conscientious effort and painstaking care in diagnosis, prognosis, and treatment, the prospect of failure is almost certain to supplant that of cure.

The prime essential is a correct and complete diagnosis: the mere fact that the patient has urethritis of gonorrheal origin is not sufficient. While always beginning in the anterior urethra, in only twenty per cent. of the cases does the infection remain limited to this part; in other words, eight out of ten patients eventually suffer from involvement of the deep urethra and the structures appertaining thereto. The extent of this involvement must always be determined; systematic examination must be made to disclose the existence of posterior urethritis, alone or in conjunction with trigonitis, prostatitis, and seminal vesiculitis. Only by this means is the practitioner able to institute intelligent treatment.

The next essential is the armamentarium: despite the triviality with which some physicians regard gonorrheal infection, we reiterate that this disease should be treated only by competent practitioners adequately equipped. Besides the commonplace instruments, the armamentarium must comprise the deep urethral instillator, endoscopes, straight and curved, with a range in calibre from twenty-two to twenty-six; cystourethroscopes and urethroscopic syringes; and finally, as the third essential, a thorough knowledge of how to use them, and a conscientious spirit in their application.

When shall the patient with gonorrhea be pronounced cured? When may he be assured of conjugal safety? Upon the answer of this weighty question may depend the future of a home; likewise the reputation of the urologist. We daily meet with extreme views: one asserting the patient to be innocuous as soon as the discharge is reduced to the so-called morning drop; the other (which is, to say the least, a blatant anachronism) that infection is never cured; that it may, phoenixlike, apparently die, and slumber in its own ashes, only to begin

life afresh five, ten or twenty years after. Both these views are illogical; both must be avoided. The patient is either infective or innocuous; which, can and must be determined. If infective he can be cured and must be treated; if free from infection he must not be denied connubial privilege. Before being pronounced clean, his condition must qualify according to a criterion embracing the following principles:

All specimens of urine obtained in the three glass test must be clear; three smears made from the affluent of the entire urethra and its appendages, and taken on alternate days must be negative; endoscopic examination must be negative as to granulations and verumontanitis; prostate and seminal vesicles must be normal to the touch and the urethra practically normal in calibre. Patients who successfully pass the foregoing tests are cured, and it is our practice to place them on probation for a period of six weeks, at the end of which time, if the urine has remained clear and sparkling, no further test examinations are required, and the patients are formally pronounced cured and permitted to marry.

If the method delineated in the foregoing is adhered to with conscientious and painstaking attention to details the practitioner need never fear for the propriety of his prognosis or the safety of his reputation. It has been our pleasurable experience to follow many of these patients to the point of begetting offspring and in not even a single instance has there been an ill consequence, which, needless to say, would have been quickly brought home had it occurred.

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"WHEN IS GONORRHEA CURED?"

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The question, "When is gonorrhoea cured?" is always timely, interesting and exceedingly important. For as long as human nature remains as it is, with all the teaching of sex hygiene, prophylactic instruction and an attempt to divert the minds of men by athletics and various other healthy means of recreation, gonorrhoea will probably always be with us. That gonorrhoea is a serious and obstinate disease to treat will not be denied by anyone who sees many cases and attempts to cure them. While the number of freshly infected patients in the clinic or at the office of the specialist is always numerous, how much more numerous are the chronic or so-called gleet cases. The complaints of patients in the latter instances date back from a few months to several years, in many instances despite more or less faithful adherence to treatment and the usual gonorrhoeal precautions. Either through neglect or ill-directed treatment, patients go about for months or years with symptoms of chronic gonorrhoea or recurrences, and if ignorant or depraved they are a distinct menace in the spread of the infection.

Authorities differ as to statistics, because even in the best regulated city health departments, where physicians are required to report venereal diseases,

many cases, for various reasons, are not reported. At best a statistical study can only be a relative estimate. It is safe to assume that there are more cases of venereal disease than is apparent from a glance at tables of statistics compiled by different men.

Admitting the importance of the medical side of the question, we also have to deal with the economic, sociological and moral issues; a discussion of the subject would never be complete without them. The decent, self-respecting man, who unfortunately had an attack of gonorrhoea is obsessed, and properly so, with the fear of marrying and infecting a virtuous girl. This point is emphasized by Abraham Flexner in his report on prostitution in Europe—"It is shocking to learn that almost one third of the reported cases of gonorrhoea occurred in married women to whom infection had been carried by their husbands." It is too well known that so many gynecological operations are necessary through the ignorance or wantonness of an uncured husband who infects his wife.

An uncured or chronic patient with gonorrhoea has dormant foci of infection in various parts of the urethral canal, prostate or seminal vesicles, which account for much ill health and invalidism. A persistent discharge, inconveniencing and distressing urinary symptoms due to strictures, or inflammation of the posterior urethra, prostate or seminal vesicles, arthritic or muscular pains due to toxins given off by the gonococci—all contribute to undermine health and morale. It is difficult to calculate the number of working days lost, as a direct result of severe acute symptoms, gonorrhoeal rheumatism, or operations for the relief of various complications. Gonorrhoea is considered a serious disease; in fact some regard it on a par with syphilis. Simple acute anterior urethritis, even under the best circumstances, frequently extends and complications set in due to the anatomical arrangement of the genito-urinary tract. It hardly needs further elaboration to convince one of the importance of following out a systematic plan to determine whether a patient is cured of his infection. The following examinations are essential in determining a cure.

MICROSCOPIC EXAMINATION.

In making a microscopic examination of any discharge presenting at the meatus or of that which can be expressed along the course of the urethra the discharge is gathered on a glass slide, and is fixed and stained with methylene blue solution in the usual way. The slide is then examined for the presence of pus cells, epithelia and bacteria. Special search is made for the intracellular diplococci. In chronic or subacute cases, gonococci are seldom found. One can usually distinguish a chronic discharge by the scattered fields of pus cells, epithelia, thin strands of desquamating tissue and the presence of specific or nonspecific cocci. A similar examination is made of morning drop secretions. When in doubt about the type of bacteria, a gram negative stain is made. Normally there should be no secretion and if any material is stained, it should not show any pus. Cases with redundant prepuce often show a variety of bacteria, due to balanoposthitis.

The morning drop complaint should not be dis-

missed lightly; patients are at times told to disregard it, as it is only "an escape of spermatozoa or spermatic fluid." It should always be examined microscopically and as long as pus cells are seen, there is a focus somewhere and it must be eradicated. The presence of intracellular diplococci in such smears is the exception, rather than the rule.

THE TWO GLASS TEST.

The patient is asked to void separately into two glasses, and the urine is held up before a light to note whether it is clear, cloudy, hazy or cloudy and sanguineous. The terms cloudy and hazy are arbitrarily used to denote the degree of pus in the urine, the former indicating a large amount of pus. If cloudy or hazy a small amount of thirty-three per cent. acetic acid, is added; if the urine remains cloudy or hazy then it is usually due to pus; if it clears on the addition of acetic acid, phosphates are the cause of the turbidity. In exceptional cases when the urine does not become clear, it may be due to marked desquamation of epithelia; this can be differentiated by microscopic examination. For practical purposes the urine in the first glass is taken to represent the washings of the anterior urethra and the second glass that of the posterior urethra. Theoretically this is incorrect. For the sake of analogy, the bladder is a tank which empties through a pipe, the urethra, which is divided into the proximal or posterior and distal or anterior urethra. The urine in the first glass really is that from both the posterior and anterior urethra, for coming from the bladder it washes away the secretions of the entire urethra. Therefore some urologists have adopted a five or seven glass test, which aims to examine separately the urine or washings with the secretions from the anterior and posterior urethra and from the prostate and seminal vesicles. Practically, the two glass test serves its purpose well, when it is carried out in conjunction with a systematic routine examination.

The number, size and general appearance of the shreds in a clear or cloudy urine, are noted; if the urine is perfectly clear these shreds are often examined microscopically for the presence of gonococci. The urine from a cured patient should show clear and contain few shreds; such shreds merely represent shedding from an old noninfective desquamating surface.

EXAMINATION OF THE URETHRA FOR STRICTURE.

Silk rubber *bougie-a-boules* and sounds are used for this purpose. The largest size *bougie-a-boule* or sound to pass the meatus is tried first. It is interesting to note that many individuals present meati that do not admit anything much larger than French number 20; this in itself in some cases may interfere with the proper drainage of urethral secretions. In such cases a meatotomy up to number 30 French is indicated. The bougie is gently passed down to the bulbomembranous junction (the site of the external urinary sphincter and the anterior layer of the triangular ligament.) It is then gently withdrawn. If there is any narrowing of the urethral calibre, or if there are any chronic inflammatory bands or ridges along the course of the urethra, these are felt to catch on the neck of the olivary tip of the bougie. Often several such tugs are felt

over indurated ridges, giving the sensation of a cobble stone surface. In soft or freshly forming strictures, the passage of such a soft elastic instrument often produces some bleeding. The size of a stricture, if present, is noted by the size of the bougie which it will allow to pass. The largest sized sound to pass the meatus is then gently passed through the entire urethra and into the bladder; the sound is now withdrawn. Normally, a sound passes in and out of the urethra by its own weight. A stricture, or one that is forming, grasps the sound as if between the jaws of a vise. This grasping sensation is quite characteristic of stricture formation. If, in spite of gentle technic, bleeding occurs, it is usually pathognomonic of a soft or freshly forming stricture.

EXAMINATION OF THE PROSTATE AND SEMINAL VESICLES.

It is advisable to first fill the bladder with a solution of boric acid or weak silver nitrate solution, for a distended bladder allows for a better examination of the prostate and seminal vesicles, which are brought down closer to the examining finger in the rectum. By a gentle sweeping of the finger, the size, consistency, tenderness and the presence of fibrous adhesions are noted; often one lobe is larger than the other and firm nodules may be present in one or both lobes. The vesicles in some cases are sausage shaped. The prostate and vesicles are gently, yet firmly rubbed from above downward, not laterally. The secretion expressed is caught on a glass slide and is either examined in the wet state or dried, fixed and stained with methylene blue. A search is made for pus and bacteria. The importance of this examination is to note the presence and the amount of pus cells. This examination should be repeated several times in the course of a few weeks. The number of pus cells, as a matter of convenience and routine, can be indicated by the use of plus signs. Four plus would indicate that practically every field examined shows an abundance of pus cells such as is seen in an ordinary urethral smear. Fewer pus cells are indicated by two or one plus; or, the examiner can use the terms small, moderate or large amount of pus. It is the exception rather than the rule to find intracellular diplococci in such smears. As other organisms can induce prostatitis, such secretion obtained by massage is often cultured for the identification of the organisms. Repeated smears should show no pus or but few very scattered fields in a cured case.

CYSTOURETHROSCOPIC EXAMINATION.

This examination is a visualization of the entire urethra from the bladder neck down to the meatus. The irrigating instruments of the McCarthy, Buerger or Greenberg types are ideal for this examination. They give splendid illumination and magnification; perfect detail of the mucosa is obtained. The irrigating fluid washes away bleeding surfaces or shreds. In the fluid medium, pus appears as rice flakes. One doing such examinations cannot but be impressed with the variety of lesions met in the urethra. In spite of clear urine and in some cases without any symptoms such lesions can remain undetected and can keep up the infection for

years and act as foci. The lesions encountered in the posterior urethra are: Uniform turgescence, so that the mucosa bleeds easily (soft infiltrations); erosions, granulations, or desquamations; congestion or enlargement of the verumontanum or polyps or vegetations or cystic conditions on or about the verumontanum. In the anterior urethra: Soft infiltrations, hard infiltrations (characterized by special paleness of the mucosa which later on becomes a yellowish white, or the urethra appears inelastic and is actually the seat of true stricture formation); on the roof and lateral walls the glands of Littre and the crypts of Morgagni are bright red in appearance and are the seat of subacute or chronic inflammation; erosions and desquamating surfaces are often seen on the floor. Cystourethroscopy is therefore a very important examination in that it calls attention to lesions that may never be suspected, and in that appropriate treatment can be instituted to cure them. It is most gratifying to the examiner to note by subsequent examinations the improvement or cure of such lesions after a rational method of treatment.

COMPLEMENT FIXATION TEST OF THE BLOOD.

This is a serological test similar to and based on the same principle as the Wassermann test for syphilis, and like the Wassermann test it is only of value in conjunction with clinical findings. A positive complement fixation test without symptoms should institute a quest for foci. On the other hand, numerous patients are seen with symptoms and objective evidence of chronic gonorrhea who give a negative test. Obviously a negative test in such cases is of no value. In acute cases, in discharging patients as cured it should be remembered that the complement fixation test should be done about two to three months after the infection has presumably been cured. On the other hand, if the blood is positive and all the other examinations show no evidence of infection, then this positive test should carry no more weight than a positive Wassermann test without any clinical or laboratory manifestations of syphilis. A positive test helps in the diagnosis of rheumatic joints.

CULTURAL METHODS FOR THE ISOLATION OF THE GONOCOCCI.

Usually the methylene blue and gram negative stains are sufficient for the identification of the gonococcus. In chronic cases where the bacteriological examinations show a variety of bacteria in smears, to establish definitely a diagnosis of gonorrhea, the secretions from the genitourinary tract should be cultured. The secretions must be grown on suitable culture media. In a paper of this kind the technical laboratory details are omitted; these are lucidly explained in standard bacteriological works. In the male the secretions from the urethra, bladder, prostate and seminal vesicles and in the female those of the urethra, bladder, cervix and vagina are utilized. This method is of great importance in differential diagnosis of inflammation in the female and often offers the only absolute way of deciding whether the gonococcus is the etiological factor. This method should be utilized when repeated smear examinations show pus but no bacteria.

COMMENT.

Gonorrhoea can be cured. In acute cases a cure may even require three months or longer. In chronic cases a much longer time is required, depending on the objective findings in the individual case. The old antiquated method of suggesting a sexual or alcoholic spree, to see whether a urethral discharge is noted thereafter, should be condemned because it is unreliable and unscientific. Likewise the examination of a condom specimen for the presence of gonococci is not enough. Too often laboratory reports of centrifuged urines or prostatic and seminal vesicle smears simply state that no gonococci are found, but with no mention of the presence or the amount of pus, which is an indicator of a focus. It is only by a systematic routine examination that one can tell whether a patient is free from infection. What is still more important foci or lesions are so often discovered that would have gone on unnoticed.

1. A cured patient should present no morning drop or urethral secretion at any time of the day.
2. Microscopical examination should show no pus or gonococci in the urine, prostatic, or seminal vesicle smears.
3. The urine should be clear, though in some cases small noninfective desquamating shreds may persist.
4. The urethral lumen should be free from any narrowing or stricture formation.
5. The complement fixation test should be negative in conjunction with the other findings.
6. In doubtful cases the secretions from the genitourinary organs should be cultured to prove the absence of gonococci on suitable culture media.
7. Cystourethroscopic examination should show the urethra free of lesions.

115 WEST SIXTEENTH STREET.

THE INTENSIVE ADMINISTRATION OF ARSPHENAMINE.

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Since the publication of the reports (1) of the treatment of women with arsenobenzol and neodiarsenol requests for the result of this form of therapy in men have been received.

The following serves as a report of the intensive specific therapy in eighty hospitalized syphilitic negro patients. The cases were divided among the syphilitic periods as follows:

Primary syphilis, twenty-eight cases; silent generalization, twenty-three cases; secondary syphilis, sixteen cases; latent tertiary, four cases; active tertiary, nine cases. Diagnosis in primary cases was made by the demonstration of the spirochæta pallida in cases where the diagnosis was at all doubtful clinically (2).

We regarded the history as of little value. The stated incubation time cannot be reliable with men who are repeatedly exposing themselves to infection. Even the duration given by the patient was more often than not at variance with the known course of the disease. Men told us, with no intent to deceive, that the lesion on the penis had been there

only two or three days, yet the inguinal nodes were enlarged and the Wassermann test was reported four plus positive.

As often demonstrated before, the frenum is a point of lowered resistance to the entry of the spirochæta pallida, and at least half of our patients presented the initial lesion in this location. In not a few of these cases, neglect and secondary infection leading to ulceration had proceeded to such an extent that the corpora cavernosa and corpus spongiosum were exposed for over an inch. In our opinion practically every lesion at the frenum harbors the spirochæta pallida.

We rarely saw the indurated, ulcerated papular chancre which bears Hunter's name. The ulcerated lesions we did see were usually larger and the tumor character was absent. One type of initial lesion was presented by multiple lesions of the free edge of the prepuce, a sort of rosette, which, because of the accompanying edema, resulted in an artificial phimosis. Another fairly common type of initial lesion was one of the meatus urinarius. The sclerosis was situated either on the mucous surface or on the skin border.

Patients were admitted with the clinical diagnosis of primary syphilis who had passed the primary serological stage and were in the stage of silent generalization. These patients presented chancres, no secondary lesions of the skin or mucous membranes but the Wassermann tests were reported positive four plus (3). Twenty-three patients were in this group. This emphasizes the conclusion that a genital lesion is often lightly considered and no medical advice or treatment is sought until the organ is so distorted as to be useless. I have seen instances of destruction of the entire glans penis, for example, for which the patient had had no prior treatment.

I had surprisingly few recent secondary cases to deal with. Of the eighty patients under treatment sixteen were in the generalized secondary period. Among the skin lesions I saw one corymbiform syphilide, one circinate secondary lesion, examples of macular and papular syphilides, a number of recurrent secondary syphilides, and five men with condylomata lata. Mucous patches were also seen. In the majority of cases the patients had had no modern treatment and in all too many cases self-treatment alone had constituted the previous therapy. Three cases were diagnosed by the serological reaction. These cases were in the latent tertiary period and presented no lesions.

One patient was admitted for bed wetting. Clinically he presented no syphilitic lesions but the routine Wassermann reaction was four plus positive. Incidentally, arsphenamine therapy did not improve his sad condition.

Nine patients were admitted with active tertiary manifestations of syphilis. The age of the infection varied from two to eight years. This group of men presented gummatous infiltration of circumcision wounds, ulcerating groin adenitis, in one case gumma of the tongue, and in a second case, gumma of the shaft of the penis at the site of his primary lesion five years before (chancre redux).

The plan of treatment was on lines laid down

by Dr. S. Pollitzer (4). This plan I have termed the intensive method in distinction to the intermittent method. The intensive method consists of the daily administration intravenously of arsphenamine for three doses. Each dose consists of four decigrams dissolved in fifty c.c. of freshly distilled and boiled water, and then alkalinized to comparative neutrality with fifteen per cent. sodium hydroxide (5). This mode of treatment is a desirable variant of the *therapia sterilisans magna* of Ehrlich.

The theoretical reason for the failure of this method was that the single dose killed a large number of spirochetes but that some few escaped and later by multiplication were nearly as numerous as before, sensitized to arsenic and more dangerous. Another reason was that the excretion of the arsphenamine was begun almost as soon as injected and that in the first few hours most of the drug was out of the body.

The only figures we had access to were those in Wolbarst's (6) translation.

Paralytics given	0.3 gm. intravenously.
First day	0.0072 gm. arsenic found.
Second day	0.0792 gm. arsenic found.
Third day	0.0053 gm. arsenic found.
Fourth day	negative.

Investigations in other patients showed the same results, the excretion of arsenic having been completed within two or three days.

Since arsphenamine is essentially thirty per cent. arsenic, it appears that injected intravenously, ninety per cent. is excreted by the kidneys in the first three days. The intensive method counteracts both of these undesirable features because the concentration of the arsenic product in the blood is kept at an efficient high level. Following the intravenous medication, mercury salicylate in grain doses was given once each week.

It has been our experience that the negro is a bad subject for mercurial therapy because of the ease with which even small doses cause stomatitis. This occurs despite the care that the patients take of their teeth and gums. They used tooth brushes twice daily and the mouth wash after each meal. We painted the gums also with a mixture of equal parts of tincture of iodine and myrrh but the results were not gratifying subjectively. In bad cases we had the buccal cavity put into good condition before we administered mercury.

Although it is too early to speak of the end results of the intensive method for using arsphenamine, it is possible to note that the manifestations were speedily cleaned up. Uncomplicated syphilitic lesions disappeared within a very short time. Early chancres and condylomata lata were readily amenable. In other words the infectious lesions were soon destroyed. The patients that remained in bed for a long period were those with secondarily infected lesions, and syphilitics with other than syphilitic manifestations. In several instances of secondarily infected incised inguinal glands the intravenous therapy alone did not heal the lesion, but in several cases which gave fluctuation of a gland that was not incised, the intravenous medication relieved the swelling. In addition the general effect of this intensive therapy on the patient has been exceedingly gratifying.

We have seen no important ill effects. In one case, the second dose of the preparation we were using gave symptoms of intolerance and we interrupted the course. The drug which gave this was salvarsan, but on the same day eleven other patients received the same preparation without any ill effect. On odd occasions, a patient would vomit after partaking of the light repast provided six hours after receiving the injection. This did not contraindicate further use of the drug, but the patient went without his luncheon thereafter. The greater number of the patients received arsenobenzol (Schamberg) which gives remarkably few reactions of any kind. We find that this preparation dissolves more readily now than formerly.

SUMMARY.

Eighty hospitalized syphilitic negro men were given the intensive arsphenamine treatment as suggested by Pollitzer. The clinical results were immediate in all uncomplicated syphilitic manifestations. The infectiousness of the patient was reduced thereby much quicker than with the same amount of the arsphenamine introduced intravenously by the so-called intermittent method. The changes in serology were most encouraging, but no attempt is made to base conclusions on them. Reference to the former publications on this method will give information on this phase of the subject.

With no further precaution than that taken for the administration of arsphenamine intermittently, the eighty men were given this intensive form of treatment with excellent results, and we do not hesitate to recommend the procedure for more general use by those especially skilled in the application of arsphenamine as generally administered.

The public health value of this method of therapy should be emphasized since the period of hospitalization of infectious syphilitic persons is much reduced. This is an important consideration in the prophylaxis of syphilis by treatment.

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15 CENTRAL PARK WEST.

Injections of Milk in the Treatment of Gonorrhea and Venereal Adenitis.—M. Trossarello (*La Riforma Medica*, April 3, 1920) has had excellent results in these conditions with the injection into the gluteal muscles of sterilized milk in doses of from five to ten c.c. Five injections were given at intervals of two or three days. There was in each case a marked reaction with elevation of temperature and local reaction which soon disappeared and was less marked after each injection.

FATAL POSTARSPHENAMINE JAUNDICE.*

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Toxic jaundice following the intravenous administration of arsphenamine, while not uncommon in large syphilitic clinics, is always of sufficient prognostic significance to command attention. A recent paper by Lynch and Hoge (1) has pointed out the paucity of medical literature upon this subject, especially in regard to the fatal cases which occur but rarely. These authors have collected a total of four fatal cases from an intensive survey of the literature; two reported by Fenwick, Sweet and Lowe (2), one by Veale and Wedd (3), and one from their own series.

In a review of several thousand doses of arsphenamine given at the Venereal Clinic of the Long Island Hospital we have been able to demonstrate seven cases of toxic jaundice which were undoubtedly due to this specific drug. All but one of the patients recovered, and since this is apparently the fifth case to have occurred, we believe it to be of sufficient interest to be recorded.

This case is made the more interesting in that the condition was produced by a single dose of arsphenamine, while the cases previously reported followed a series of intensive treatments. The patient remained in the hospital throughout her illness and this made possible an exceptionally complete study of her condition from every possible angle. Moreover, she appeared at a time when I was investigating the causes of the postadministrative reactions of arsphenamine (4) and for this reason the laboratory reports of her case are of considerable value.

CASE.—The patient (Hospital Number 40014) was a very well developed and nourished woman, thirty years old, weighing about 170 pounds, who entered the venereal service of the hospital for the treatment of gonorrhea contracted maritally. Her previous history was unimportant save that there was a suggestion of luetic infection from her story of frequent miscarriages.

Her physical examination was entirely negative except for a slight leucorrhea, a smear from which showed Neisser's organism in large numbers. A blood Wassermann was found to be positive and she was accordingly transferred to the syphilitic division for treatment.

On January 24, 1919, she received four tenths gram of arsphenamine intravenously. She suffered a slight immediate reaction with nausea and some vertigo, but on the following day she had entirely recovered. About five days later she began to complain of a general weakness and lassitude, the like of which she had never experienced before. With the exception of a slightly reddened throat her physical findings were negative. Laboratory examination of a twenty-four hour specimen of urine showed nothing of importance. All antisyphilitic treatment—mercury and potassium iodide—was stopped.

For the next two weeks the patient continued to

*From the Venereal Service of the Long Island Hospital.

grow weaker without any other signs developing; on February 21st, about one month after receiving the arsphenamine, she showed a slight icteroid tint in the scleræ. No bile was found in the urine. A well marked jaundice was seen the following day and bile was easily demonstrated in the urine; fecal bile was found in normal amounts. As the jaundice increased the prostration became more marked so that the patient was obliged to remain in bed.

At this time she began to complain of a terrific burning pain in the right thigh which was not well localized. Small areas of hyperesthesia the size of a silver quarter could occasionally be marked out upon the anterior surface of the thigh. On the following day, small purpuric spots were seen developing over the areas just described. The pain accompanying the development of these ecchymotic areas was so great that sedatives were required to comfort the patient.

From this time on purpuric areas continued to develop over all parts of the body. The jaundice was increasing in severity; the stools still contained bile, while the urine, of course, showed it in large amounts. There was apparently no change in the size of the liver or spleen. On February 26th the patient began to vomit bile stained fluid which microscopically showed little of interest. Purpuric spots then developed upon the mucous membranes of the mouth and pharynx and the vomitus gradually became coffee ground in appearance and was found to contain much blood. Occult blood was found in the stools.

Previous weekly examinations showed the blood to be normal. Examination at this time showed: erythrocytes 5,600,000; leucocytes 13,000; hemoglobin (Sahli) 100 per cent.; no erythroblasts, no anisocytosis or poikilocytosis. A differential leucocyte count showed: Seventy-four per cent. polymorphonuclears, twenty-five per cent. mononuclears, and one per cent. eosinophiles. Clotting time of the blood was found to be slightly increased. Blood pressure as at entrance was systolic 110, diastolic 75.

Urine examination: twenty-four hour volume 960 c.c.; dark brown in color; slightly alkaline, albumin found in small traces; no sugar; bile pigments in large amounts; no blood; Marsh tests for arsenic negative. Centrifuged sediment showed granular bile stained casts, a few epithelial cells and leucocytes.

Stool examination: formed, soft, dark brown, normal odor, no gross mucus or blood. Chemical examination: alkaline, bile present, occult blood found in large amounts, Marsh test for arsenic negative. Microscopic examination: many undigested meat fibres, unchanged fat globules in excess, many erythrocytes; no pus cells.

For a brief period the patient seemed to be getting better; the vomiting ceased, the patient looked and felt better. The jaundice continued to increase however, and on March 20th, she was forced to return to bed again. The weakness and apathy returned and the purpuric spots became more tender. A painful molar having developed, the dentist was consulted and he extracted four loosened teeth without great difficulty.

Due apparently to the great increase in the coagulation time of her blood, which upon test was found to be delayed forty minutes in comparison with a previous test which showed a delay of six minutes, the patient continued to bleed profusely from the gums. Application of local hemostatic solutions were of slight avail. During the night, the patient swallowed much of the blood and on the following morning vomited a considerable quantity of partially digested blood with some mucus.

The patient's condition became so poor that an immediate transfusion of whole blood was decided upon. Accordingly, Dr. L. H. Rockwell and myself, using the Kimpton tube method and securing about 450 c.c. of blood from a satisfactory donor, transfused the patient.

For a short interval following the transfusion, the patient's pulse and general condition seemed to be considerably improved, although the oozing from the gums still persisted. Subpectoral salt solution was given and a rectal tap apparatus started. The patient continued to go down hill, however, and after sinking into a semidelirious state died soon afterwards.

The postmortem findings so approximate those previously described by Lynch and Hoge as to be almost identical. They reported that "the postmortem examination revealed hemorrhagic phenomena in one or more of the viscera of all the bodies. In one of the cases the petechial hemorrhages were present in almost all of the viscera, but especially in the walls of the stomach and small intestines. There were a few points of hemorrhage in the kidney and visceral pleura. The other cases showed the walls of the stomach and intestine deeply injected. The pancreas seemed free from gross pathological lesions. Microscopically the kidneys showed a type of tubular nephritis much like that seen in cases of mercurial poisoning. The liver was small and mottled. It did not favor identically any of the more common types of cirrhosis. There was little or no fatty degeneration in any of the specimens examined.

The stomach in our case showed a large area of submucosal hemorrhage upon its lesser curvature. There seemed to be many small bleeding points near the pyloric end of this area which also showed numerous tiny varices. This would tend to indicate that the blood which was found in the vomitus was not due entirely to that which was swallowed.

The liver differed in some degree from previous findings in these cases. It was slightly larger than normal, and purplish red in color. The surface was smooth and resistant. The cut surface was essentially normal in appearance; there was no evidence of fatty degenerative changes. The gallbladder was large and filled with many stones; the ducts were patent and no obstruction of any kind was found. All of the tissues of the body were deeply stained with bile pigments. The spleen showed nothing of interest.

COMMENT.

The interest in these cases is focused upon the etiological factors responsible for the condition. To a great extent the symptomatology and pathological findings point incriminatingly toward the

employment of arsphenamine and the unusual response of the body toward the arsenic containing drugs. The story, however, is not a clear cut one either of acute or chronic arsenic poisoning. In the case just reviewed, the symptoms were late in developing and insidious in origin. It is somewhat difficult to believe that the small quantity of arsenic—about 122 mg.—which was contained in the first and only dose of arsphenamine that was administered, was capable of producing all of the subsequent symptoms and finally the death of a patient who apparently was in excellent physical condition prior to the beginning of her antisyphilitic treatment.

Previous writers have commented upon the unexpected histological picture found in the kidneys in these cases, and invariably they have described the renal findings as being comparable to those seen in mercuric poisoning. This suggests that there may be other factors concerned in the production of the condition. In all of the cases described the patients received both arsenic and mercurial medication and while it cannot be said that the picture presented in these cases is one of combined poisoning both by arsenic and mercury, yet it is not unbelievable that under certain rare conditions these two substances enter upon a synergistic relationship within the body.

The need of accurate experimental work along these lines is only too evident. Using such data as we have, however, it does not seem rational to classify these cases of toxic and fatal jaundice under the so-called idiosyncratic group—a group of unexplainable reactions which occasionally follow the use of arsenic. The importance of simultaneous mercury medication should not be forgotten, and it is not at all unlikely that the untoward symptoms and occasionally death itself which follow the administration of small doses of arsenic and mercury may be due to a mutual interaction of these two powerful agents upon the important organs of the body.

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Different Spirochetes in General Paralysis and Common Syphilis.—A. Marie and Levaditi (*Presse médicale*, December 24, 1919) have made a comparative study of the local effects in rabbits of inoculation with virus from a syphilitic chancre and inoculation with virus from the blood of paretics. The viruses in the two instances were found to be different as regards period of incubation, duration of the lesions produced, appearance and pathogenic properties of the lesions, and crossed immunity. The conclusion reached was that there was probably a neurotrophic form of syphilis distinct from the ordinary, dermatrophic syphilis.

REACTIONS FOLLOWING INTRAVENOUS ADMINISTRATION OF ARSPHENAMINE.

The Influence of Atropine Sulphate and Adrenalin Chloride Upon These Reactions.

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(From the Department of Dermatology and Syphilology of the Jefferson Medical College, Philadelphia, and in collaboration with Henry G. Munson, M. D., David M. Sidlick, M. D., and A. Strauss, M. D.)

While the symptomatology of the reactive phenomena at times attending the intravenous administration of arsphenamine has been carefully and systematically studied, the underlying causes of these reactions remain shrouded in obscurity, and the suggested preventive remedies have proved of but little value. Out of the great mass of theoretical considerations advanced relative to the reaction following the intravenous administration of arsphenamine only two factors stand out prominently and they are, first, those that relate to the patient and, second, those that relate to the medicament, i. e., arsphenamine. In another paper, we indicated that in our belief, arsphenamine might produce reactive phenomena, either as a result of some impurities in its composition, or due to some chemical interaction between the medicament (arsphenamine) and the elements of the blood, or both factors may be operative at the same time. Let us briefly review some of the more authoritative theories which have been suggested relative to arsphenamine reactions.

Soon after the employment of arsphenamine began, and reactive symptoms were being reported, Wechselmann announced his *Wasser-fehler* or water error theory as explanatory of the untoward symptoms. It was his belief that the decomposition of protein material in the water was the responsible factor. An extended experience has shown that while in a measure his contention has proved correct, it explains only a small number of the reactions encountered. In 1910 Neisser brought forth the hypothesis that the rapid killing off of spirochetes following arsphenamine injection, and the liberation of endotoxins which circulate in the blood stream, would account for the untoward phenomena encountered. In a recent paper we have proved that this theory is probably incorrect, as normal patients receiving arsphenamine intravenously report reactive symptoms in the same ratio as syphilitic patients receiving the identical serial number of the same make of arsphenamine, administered under exactly similar conditions. Among others McKee in 1912 observed that the injection of acid and partially alkalized arsphenamine solutions produced a precipitate and reactions. This observation has been abundantly confirmed by others.

Syphilographers have for a long time noted that the mental attitude of the patient treated exercises an important influence on the reactive symptoms. This psychic state we have observed, not only when administering arsphenamine, but also when injecting the mercurial preparations intravenously.

In 1917 Danyzs published his precipitation hypothesis as an explanation of the reactions following arsphenamine medication. In this hypothesis, Danyzs states that the carbon dioxide and sodium bicarbonate of the blood changes arsphenamine into an insoluble base which is carried in the circulation till dissolved by the leucocytes and the organic bases of the plasma. The biphosphates of calcium, sodium and magnesium, as well as the chloride and iron salts, are alleged to behave similarly. Schamberg and his associates, after an extensive study of Danyzs's theory, conclude that many of the hypotheses which Danyzs advanced are probably incorrect, stating as their belief that many of the reactions following arsphenamine treatments are due to some impurity in the arsphenamine, which they have not isolated as yet and which they have termed substance X. We must not lose sight of the fact that the reactions in some of our patients may be explained on the basis of a hypersusceptibility to arsphenamine (arsenic), and that this idiosyncrasy may act as either the sole cause or as the predisposing one.

A survey of the views herein expressed points to errors of technic, the syphilitic state of the patient, his mental attitude, the hypersusceptibility of the individual subjected to the treatment, impurities in the drug, and the interaction between the medication and the elements of the blood, all or some of these offering an explanation of the reactions following the administration of arsphenamine. In this study two drugs were administered intramuscularly and their ability to prevent the early reactions attending arsphenamine treatments noted. The medications employed were atropine sulphate and adrenalin chloride in a one in one thousand solution. Atropine sulphate was selected because of its well known inhibitory effect.

In our series atropine sulphate, one seventy-fifth of a grain, was administered intramuscularly about ten to fifteen minutes before the arsphenamine injections. A total of one hundred and one patients received the intramuscular injections of atropine sulphate and ninety-five patients were used as controls. Both groups of patients received the arsphenamine of the Dermatological Research Laboratories of the same serial number and administered under similar conditions. A statistical study of the reactive symptoms shows the following results: In the atropine series of one hundred and one patients thirty-four, or thirty-four per cent., reported absence of any reactions, while sixty-seven, or sixty-six per cent., complained of various reactive phenomena. In detail, twenty-two, or thirty-three per cent., complained of fever; twenty-nine, or forty-three per cent., of chills or chilliness; forty-five, or seventy per cent., of headache; thirty-nine, or fifty-nine per cent. of nausea; nineteen, or twenty-eight per cent., of vomiting, and sixteen, or twenty-three per cent., of diarrhea. In the control series of ninety-five patients thirty-one, or thirty-three per cent., were free from reactions, while sixty-four, or sixty-seven per cent., experienced untoward reactive symptoms. Out of this number sixteen, or twenty-five per cent., complained of fever, twenty-three, or thirty-six per cent., of chills or chilliness, thirty-seven, or

fifty-eight per cent., of headache, twenty-nine, or forty-five per cent., of nausea, twelve, or twenty per cent., of vomiting; and twenty-three, or thirty-six per cent., of diarrhea.

From these tables it is apparent that in so far as our series is concerned, the intramuscular injection of atropine sulphate had no appreciable influence for the prevention of the early reactive symptoms which may follow arsphenamine treatment. The percentage of patients reporting total absence of reactive symptoms was equal in both the atropine and control series, and although some differences were recorded in the percentage of the individual symptoms, such can readily be accounted for on the basis of individual peculiarity.

In another group of patients adrenalin chloride (1 in 1,000 solution) was injected intramuscularly in the dose of 0.5 c. c., a few minutes before the arsphenamine was administered. At first we attempted giving the adrenalin intravenously, but the symptoms which developed as a result of the injection were so alarming that this method of administration was discontinued. The total of ninety-seven patients received the adrenalin preceding their arsphenamine treatment, while forty-two patients received the arsphenamine alone. Both groups of cases received the arsphenamine of the Dermatological Research Laboratories of the same serial numbers administered under identical conditions. In the adrenalin series, twenty-four patients, or twenty-five per cent., were free of reactions, while seventy-three, or seventy-five per cent., reported some untoward symptoms. The following is the statistical study of the reactive symptoms reported: Fever occurred in twenty-six patients, or thirty-six per cent.; chills or chilliness in twenty-two, or thirty per cent.; headache in forty-nine, or sixty-seven per cent.; nausea in forty, or fifty-five per cent.; vomiting in sixteen, or twenty-two per cent.; and diarrhea in twenty-two or thirty per cent.

In our control series, there were forty-two patients, and of this number eleven, or twenty-six per cent, reported a total absence of reaction; thirty-one, or seventy-four per cent., reported untoward symptoms, which were as follows; fever in nine instances, or thirty-five per cent.; chills or chilliness in ten, or thirty-eight per cent.; headache in seventeen instances, or sixty-five per cent.; nausea in thirteen, or fifty per cent.; vomiting in seven, or twenty-seven per cent., and diarrhea in nine, or thirty-five per cent. Although Millian reported favorable prophylactic influence from the use of adrenalin in arsphenamine injections, our series seems to show the same percentage of reactions whether adrenalin was employed or not.

RÉSUMÉ

As a result of our investigation, we can conclude that the injections of either atropine sulphate in the dose of one seventy-fifth of a grain or adrenalin in chloride in the dose of 0.5 c. c. previous to arsphenamine injections, in no wise influences the occurrence of early reactive phenomena.

I wish to express my thanks to my assistants Henry G. Munson, M. D.; David M. Sidlick, M. D., and A. Strauss, M. D., for their cooperation during the course of this investigation.

THE VENEREAL DISEASE PROBLEM.*

BY THE HONORABLE WILLIAM RENWICK RIDDELL,
LL. D., F. R. H. S.,

Toronto, Canada.

President of the Canadian National Council for Combating
Venereal Disease.

It cannot be said that the subject to be discussed is one which is palatable or delightful, yet the situation must be faced and faced honestly and without flinching. We may not find it as pleasant to speak of the cesspool and the scavenger as of the rose garden and the gardener—and yet the one may be as important as the other, or vastly more so. There are diseases which are eating the heart out of our people, sapping their very life—unless well grounded estimates are gravely wrong half a million of Canadians are infected with the most serious form of venereal disease; in Toronto at least forty thousand, many, very many without knowing it. For one reason or another, the terrible extent of these diseases is not generally known—delicacy has been considered to forbid the discussion of them in public and those who suffer from them do not disclose their disease willingly. In insanity we know that until the other day it was considered not only a calamity but also a disgrace that any one of the family should be considered insane; a little of the same feeling lingers in respect of cancer and perhaps other diseases.

In venereal diseases there has been a widespread view that those who suffer from them are being punished for sin. That thought has prevented the members of the family of the affected from making known the state of their kinsfolk; and the stricken one himself has concealed from all eyes that he is stricken. But medical men have long known the extent of these diseases; and at length it has become absolutely necessary for the Government to take notice of them. It has long been cast up to governments as a reproach that in case of a disease attacking animals the utmost care and attention was at once paid to them but that when human beings were attacked little if any attention was paid to them. Whether that is true or not I do not enquire—the Governments, Dominion and local, are now awake to the terrible importance of venereal diseases. The Dominion Government has set aside two hundred thousand dollars to fight this powerful enemy of the human race and the Provincial Governments are also doing their share.

It was full time. In Britain the country was wide awake; in the United States the efforts of many agencies were bent to the extirpation or at least diminishment of the evil. In both these countries it was considered that the end could be best attained with the assistance of a national council, a semiprivate body acting in harmony with the central and local authorities, and our organization was called into existence for that purpose. I was honored by being made president of the council, an honor unexpected as it was unsought; and in view of the tremendous importance of the movement I could not refuse to give what assistance I could.

*Presented before the organization meeting of the Toronto Committee of the Canadian National Council for Combating Venereal Diseases, Toronto, March 24, 1920.

It is not the sinner alone who suffers—even if that were so the case would be hard enough—but the danger of infection is never absent from millions of the innocent; not a man, not a woman, scarcely even a child but runs the risk of infection every day. These we must in some way protect. Tuberculosis, smallpox, measles, scarlatina, all call for prevention and curative measures and such measures are promptly taken. Syphilis, which is more to be dreaded than any or all of these diseases, and is more common than any (except possibly measles), calls for more careful measures.

Think of the effect of syphilis: it affects about eight per cent. of the total population; is transmissible to the offspring and causes death in eighty per cent. of those infected; is the cause of ten to thirty-five per cent. of all insanity; of most mentally defective children; of locomotor ataxia; of paresis; of apoplectic and paralytic strokes in early life; of nearly half the abortions and miscarriages; of a large proportion of diseases of the heart, blood vessels and other vital organs. Syphilis decreases the length of life about a third and greatly decreases one's earning capacity during the remainder.

And what is very generally considered of trifling importance, "not much worse than a cold," gonorrhoea, while not so virulent, is still a deadly foe to the Canadian people, and is more common than syphilis. Gonorrhoea is the cause of more than ten per cent. of all blindness; of eighty per cent. of congenital blindness; of many surgical operations on the female generative organs; of many chronic diseases of the joints, bladder and generative organs, and this disease greatly decreases one's earning capacity.

These surely are enemies worth fighting—not in my time or in yours, not for generations to come will they be extirpated; but something, much, can be done by us in our generation.

We are not perhaps to expect that those who know themselves to be infected will do much for others—God knows they have a heavy enough burden of their own to bear—but I feel that I may call upon those who know themselves to be clean to help those less fortunate, and to assist those who are clean to remain clean.

The appalling versatility, the unearthly cunning of these diseases are such that thousands and tens of thousands have their seed within their bodies without knowing it, and I am well justified in saying that no man can be sure that today he is so clean and so immune from infection that he will be safe tomorrow. We intend to educate people, to make such investigation as will enable us best to educate the people while we are ourselves learning. We shall try to do all possible to prevent infection and to cure it where unhappily incurred.

Some Notes on Asexualization, with a Report of Eighteen Cases.—Martin W. Barr (*Journal of Nervous and Mental Disease*, March, 1920) presents a study of ancient literature upon asexualization and notes the various stages in the development of the practice for the mentally deficient and moral degenerates in state institutions of this country. A series of eighteen case reports sets forth in detail the actual results attained.

MEDICAL MEN IN THE AMERICAN REVOLUTION.

The New York Campaign of 1776.

BY LOUIS C. DUNCAN, M. D.,

Washington, D. C.,

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(Concluded from page 460)

The encounter at White Plains took place on October 28th. The British attacked McDougall's New York Brigade, a part of which did not stand well, obliging the whole to fall back. Washington then retired to a stronger position near North Castle. The losses were not serious; less than a hundred in killed and wounded. As Morgan says, he cared for these wounded, both on the field, and in a sort of general hospital at North Castle. This double duty, instead of bringing about praise, seems only to have caused increased complaint: as he indicates:

Here I cannot but feel for the hospital surgeons, who before they could obtain any quarters, except such as a few hours' industry enabled them to do, in a country which was not well calculated to afford any good, were suddenly overwhelmed with numbers of sick sent them, as well as the wounded in time of an engagement, and whilst many of the regimental surgeons were absent in the country, having left their corps in the field without assistance, contrary to the orders of July 3rd; at a time when an engagement was considered inevitable there were few at hand to give any aid. Hence, while the hospital surgeons were preparing matters at their proper stations in the hospital, clamors were excited against them for not being with the troops; and when they were detained at the lines, to supply the place of regimental surgeons who ought to have been there, the wounded, who were conveyed to the hospital, naturally demanded the attention of the whole body of surgeons, to administer to them.

On November 5th he issued a circular requiring the surgeons to return to and remain at their proper places (17).

The action of Morgan at this time cannot be too highly commended. We shall see later how Shippen managed affairs at Trenton and Princeton.

When Morgan finally returned to North Castle he attempted to put the hospital in order there by constructing berths, building chimneys, etc., but could get little done. He states that some died from effects of cold, which was severely felt at that time—the latter part of November. Leaving what sick could be cared for at North Castle, in charge of Drs. Adams and Charles McKnight, he had the remainder (about a thousand) sent to Stamford and Norwich in Connecticut. That colony had established hospitals in all the principal towns between Hartford and New York. These too seem to have been taken over by the Congress. Morgan says that he visited both places in person, and that they handled nearly two thousand patients, refusing not a single one.

The hospital at Stamford was in charge of Dr. Philip Turner (18) and received in all about twelve hundred patients. Morgan says that it was well supplied, that the patients were comfortably provided for, and that most of them recovered. There is a letter from Dr. Turner, in November, recommending the discharge of 191 men at Stamford, as no longer fit for duty. On November 30th he again asked to have seventy-three discharged. He then said there were six or seven hundred in the

town, largely convalescents, but of whom not a fourth would be of any service. As the regiments to which they belonged were soon to be disbanded, he recommended that these men be discharged. Apparently this was done, for Morgan says that in February but twenty-five of the men remained in hospital. There is no account of any serious amount of sickness or many deaths at this hospital.

The hospital at Norwich was in charge of Dr. William Eustis. He reported that upwards of seven hundred sick and wounded were well provided for and attended with satisfaction. When he left Norwich, in March, 1777, but eight or ten remained. On December 10th, Eustis wrote to Heath, saying that he had four hundred sick, mostly convalescents. He was discharging the militia men and asked authority to discharge those belonging to Continental regiments also, as their terms of enlistment would soon expire. The authority was granted.

On November 13th all the troops of New York and the colonies south were on the Jersey side, at Hackensack, Amboy, Newark, Brunswick, and Elizabethtown. Morgan left New Castle and crossed the Hudson about November 12th. He found the army in rather a bad state and entirely destitute of hospital surgeons to take charge of the wounded in case of an attack. The resolution of October 9th, dividing the hospitals, was at first believed by him not to take away his general supervision. With Washington's permission he went to Philadelphia for the purpose of laying the matter before Congress and getting an explanation of the meaning of that resolution. He was unable to obtain an audience, and in a few days the Congress adjourned to Baltimore. He then returned to headquarters and there received a letter from a member informing him that it was the design of Congress that he should be restricted to the east side of the Hudson. He immediately started for his station, where General Lee now commanded.

On November 20th the British had landed six thousand men above Fort Lee. The garrison was withdrawn, losing two or three hundred tents, a thousand barrels of flour, and a few guns. On the 21st, Washington wrote from Hackensack saying that he had not above three thousand men, much broken and dispirited, with no intrenching tools, or other implements. He recommended that Lee come to his aid with his Continental troops, but did not order it. He then crossed the Hackensack, beginning his retreat. A return on November 23rd showed 5,410 men present for duty, but 1,360 were to be discharged on December 1st, and 950 more on January 1st. The Flying Camp was going to pieces. The condition of this army was desperate. On the 24th Congress authorized Washington to call the Pennsylvania and New Jersey regiments from the Northern Army; the Light Horse of Virginia, and the militia of Pennsylvania, known as the Associators. On this day Washington crossed the Passaic to Newark. The troops were without tents, poorly clad, marching wrapped in blankets, and presented a miserable appearance. The sick at Newark appear to have been sent to Morristown, and then to Bethlehem and other places.

During the latter part of October and five days

of November the movements of the British were a puzzle to the Americans. By threatening first one side and then the other, they had finally brought about a division of the Continental Army. On November 4th they retired toward the Harlem. On November 10th the division took place. General Lee was assigned to the troops east of the Hudson. He had seven brigades, thirty regiments, of New England troops. On November 24th his return showed 5,589 present fit for duty; 1,290 present sick; and 1,599 absent sick. General Heath was given three small brigades; also New England troops, for the defense of the Highlands. His headquarters was about Peekskill. He had on November 9th, 2,135 present fit for duty; 403 present sick; and 885 absent sick. Washington, with Greene, took all the troops from New York and the states to the south, for the defense of the Jerseys. At this time his force may have amounted to eight thousand men, but it decreased very rapidly, and on November 23rd he had but 5,410 present for duty. Of these, a third would claim their discharge on December 3rd, and a second third on January 1st, while the troops of Lee and Heath remained longer and were more promptly replaced.

On November 16th the blow fell at Fort Washington. After a doubtful defense, the post was surrendered with great stores and twenty-seven hundred prisoners. The force included Magaw's and Shea's Pennsylvania regiments, Rawlin's Maryland riflemen, and some militia from the Flying Camp. Dr. Hugh Hodge and Dr. James McHenry were among the prisoners (19) also Dr. John Beatty (20). The captures of the British at Long Island, Fort Washington and in various lesser conflicts now amounted to more than three hundred officers and 4,430 men. In this campaign they had captured almost as many men as Burgoyne surrendered at Saratoga. Fortunately for the Americans, then as since, men were their most plentiful war commodity. They were replaced, though the recruiting of men took time.

When the British (under Cornwallis) advanced on Hackensack, General Greene ordered the sick sent to the country. They went in various directions; about a hundred of Colonel Bradley's regiment went to Fishkill, where the New York Council of Safety authorized Dr. Chauncey Graham to care for them in the unfinished academy. When the army was divided General Heath, with the smaller division, was left without a general hospital. On November 19th he wrote a letter making a proper complaint (21). Morgan, then at North Castle, rode up to Peekskill, and interviewed Heath on the subject of a hospital and surgeons. He offered to furnish the surgeons and fit up a hospital for three hundred sick, as soon as the building should be ready (22). When he called on the quartermaster for workmen and material to put the buildings in order, build chimneys, construct berths and other necessary equipment, the quartermaster replied that every man was on some necessary work, and recommended that he apply to General Heath. Morgan did so, and the reply received was, "That the General did not choose to meddle with anything to be done in the quartermaster general's department."

This is a sample of Morgan's difficulties, here, at Hackensack, and other places. Dr. Adams and Dr. McKnight were sent to Peekskill, but as no buildings were available the sick had to be taken twenty miles across the Highlands to Fishkill. On December 5th the New York Convention informed Heath that barracks for two thousand men were being constructed between Peekskill and Fishkill; that the sick could be cared for in some of these, and that more would be built if necessary.

The year was drawing to an end and with it Morgan's service as medical director. On January 9th, 1777, Congress, without consulting Washington and without giving any hearings, passed a most unjust resolution dismissing both Morgan and Stringer from the army. (23.) A later committee found that there was no charge against Morgan's character or ability, but his reputation was irretrievably injured, and he was left a disappointed and broken man; sacrificed as a sort of scapegoat, on account of public clamor, for faults more chargeable to Congress than to himself.

The political game was played and Morgan was thrown to the wolves. His tireless energy under every discouragement; his faithfulness and economies; his integrity of character which made work for the sick and wounded, not personal favor, the goal—all were forgotten. It is true that the hospitals had sometimes failed. So had every department of the army, and the army itself, failed. Treat every man according to his deserts, as measured by success, and they had all been hanged. The commissary failed, the quartermaster failed, the whole army was beaten in every battle, outmaneuvered and outwitted; at the last of the year it was a wreck which Washington himself said would come to an end within ten days.

Little credit can be claimed for the General himself in the actual management of this, his first campaign. All were amateurs pitted against professionals. All had to learn the difficult art of war through the costly lessons of failure. The real encomium of all is, not that they had any success, but that they stood steadfast in the face of continual defeat. Any fair comparison will prove that the Medical Department of the Continental Army was handled as well as any other department. But, following the custom of politicians, public clamor had to be appeased by a sacrifice. Morgan was even informed that he was not dismissed on account of any particular act or omission, but because of general complaint. That he was given no hearing, no chance to defend himself, only accentuated the meanness of this act of injustice.

The New York campaign actually came to an end when Washington and then Cornwallis crossed the river into New Jersey. The contest was thenceforth for the Jerseys, possibly Philadelphia. The Continental Army was fatally divided. Gates had above five thousand troops for duty at Ticonderoga; Lee had as many east of the Hudson; Heath had three thousand in the Highlands. Washington probably had the weakest force of all, about five thousand, of whom only half were Continentals.

This campaign had been very near a total failure. Every battle had been lost; New York surrendered;

nearly five thousand of the army had been taken prisoners; and toward the end the men had not stood well in battle. Yet in the whole series of battles less than a thousand men had been killed and wounded. Probably not more than two hundred had been killed or had died of wounds, and six or seven hundred wounded who recovered. Of the five thousand prisoners at least half died of disease and neglect. It is impossible to make even a reliable estimate of the losses from disease from the time the army reached New York until the end of the year. I do not believe that five thousand would be at all high. At least as many more were lost in the Northern Army. The battle losses (killed and wounded) of that army were also very small, little if any more than five hundred. The British had taken a thousand prisoners, most of whom were reasonably well treated and returned by exchange. Those officers captured at Quebec in December, and at Three Rivers in June, reached Elizabethtown, New Jersey, in September.

The sufferings of American prisoners of war in New York were long the subject of bitter complaint. The prisoners taken on Long Island, at Fort Washington, and elsewhere were crowded into buildings in the city and into old hulks in the harbor, where under the worst sanitary conditions they died by hundreds. Both smallpox and typhus contributed to the death roll of these wretched victims of the war. In the city the principal prisons were: the Middle Dutch Church on Nassau Street, afterward the Post Office; the Lutheran Church, at the northeast corner of Frankfort and William Streets; the old Provost Prison, converted into the Hall of Records in 1831; the Huguenot, the Brick Church, and the Friends' Meeting House; the Van Cortlandt Sugar House; another near the Dutch Church; and the Rhinelander Sugar House, at the corner of William and Duane Streets. In all these places the sufferings were intense. "I have gone into a church," writes Colonel Ethan Allen, "and seen sundry of the prisoners in the agonies of death in consequence of very hunger, and others speechless and near death, biting pieces of chip. . . . The filth of these churches was almost beyond description. I have seen in one of them seven dead at the same time." Three thousand were crowded into the Dutch Church, but an outbreak of smallpox compelled their removal. Colonel Ethan Allen, Major Travis of Virginia, Judge Field of Bergen, Major Van Zandt and others of rank were subjected to the brutality of one Captain Cunningham, who boasted that he had starved two thousand rebels by selling their rations.

The treatment of military prisoners at that time was generally inhuman. It was the more so in the case of the colonists who were considered as rebels, to be punished as well as imprisoned.

Clothed in rags and scarcely covered from the wintry air, crowded in narrow rooms and weakened by disease, the prisoners died by the hundreds. The feeble shivered in the wintry blast, the sick lay down on beds of snow to perish. Food was of the coarsest kind and was served out in scanty measure. Smallpox and the deadly jail fever raged unopposed. Every night ten or twenty

died; every day the meagre bodies were thrown into pits, with no burial rites. Even when led out for exchange there was little hope, for many died on the way home, or lingered on for but a few miserable weeks. So wretched was the condition of these exchanged prisoners that Washington refused to consider them fit subjects for exchange. "You give us only the dead or dying," he wrote to Howe, "for our well fed and healthy prisoners," and pointed to the condition in which they reached him, diseased, famished, emaciated and dying, as they were conducted to their quarters.

The *New Hampshire Gazette* of April 26, 1777, said:

The enemy in New York continues to treat the American prisoners with great barbarity. Their allowance to each man for three days is one pound of beef, three wormeaten biscuits, and a quart of salt water. The meat they are obliged to eat raw as they have not the smallest allowance of fuel. Owing to this more than savage cruelty, the prisoners die fast, and in the small space of three weeks (during the winter) no less than 1,700 brave men perished. Lieutenant Collin narrates that he with 225 men were put on board the *Glasgow* on the 25th of December, 1777, to be carried to Connecticut for exchanges. They were on shipboard eleven days, crowded between decks, and twenty-eight of their number died through illness in that brief space of time.

The contagion of the prisons did not fail to spread to the city. During the winter the smallpox made fearful ravages. Hundreds of the citizens died, and the wealthy fled in fright to their country homes, to undergo inoculation. The violent putrid fevers of the prisons spread to the inhabitants. New York was full of mourning. Of thirty persons in one family only ten escaped. The graveyards teemed with burials. The summer air brought no relief, but seemed malarious and deadly.

Terrible as were the conditions in these prisons, they were even worse on the prison ships: old hulks moored near Wallabout Bay. The most notorious of these was the *Jersey*, whose evil repute is scarcely less than that of the Black Hole of Calcutta. Her guard was composed of Hessians. Frequently a thousand Continental soldiers were confined on board, and there they sickened and died by hundreds. At night the hatches were battened down, in the morning the jailers shouted, "Rebels, turn out your dead." No aid could be extended to them, not even medical service.

These facts are recorded merely to show the price paid by the colonists for liberty; that the people of today may not forget the sufferings of those who, going forth to battle for freedom, died in misery and filth in these horrible prisons; aiding, however, in securing that freedom for us.

During the year 1776 there were in service forty-seven thousand Continentals, one year troops; and twenty-seven thousand militia, who served from a few days to a few months, some near a year; so many never enlisted in one year again. Their casualties may be estimated roughly at one thousand killed or died of wounds, twelve hundred other wounded, six thousand taken prisoners, ten thousand died of disease, and several thousand who deserted or disappeared. At the end of the year the term of enlistment of nearly all expired. Some few regiments had been organized later than others;

some were persuaded to remain a few weeks beyond their terms of service; but the main Continental Army disappeared, the new one was not yet formed, and the often reviled militia had to fill the gap, as at Boston the year before. Fortunately for the country, the British Army followed its time honored custom of going into winter quarters. No offensive movements were made after December. Time was thus given to organize a new army and to prepare for the next year's campaign. Congress had already provided the necessary legislation, and recruiting was in progress. That the work could be done in the face of general defeat and failure throughout the year is an enduring memorial to the faith and steadfastness of the struggling colonists.

NOTES.

12.—DR. MORGAN TO GENERAL WASHINGTON.

NEW YORK, *September 12, 1776.*

Agreeable to orders I have been in the County of Orange and collected seven members of the Committee and spent the whole of yesterday and part of this day in viewing the country, and looking out for proper covering for the reception of the sick and wounded.

I am sorry to report that in a circuit of fourteen miles in that County, I cannot find or hear of any suitable accommodations for more than about one hundred sick. No country can be worse provided in all respects; and the places proposed are remote from any landing. From the knowledge I have of New Ark I am persuaded it is a place infinitely superior in all respects for the establishment of a general hospital. There are but four miles of land carriage required; all the rest is water carriage. The houses are numerous, large and convenient. If it be objected that they are full of inhabitants from New York, so is every hovel through Orange County; and as to the town of Orange, I cannot find that there is room for one sick person without incommoding some one or other.

After this report, which is grounded on the most careful inquiry and inspection, I await your Excellency's further orders; but if I may be permitted to offer my sentiments it is that no time be lost in applying to the Committee at New Ark by requisition for room for the sick; and if your Excellency thinks proper, I will immediately repair with all despatch to urge the matter without delay, or proceed in any other way your Excellency may see fit.

I am your Excellency's most obedient and very humble servant,

JOHN MORGAN.

13.—Dr. William Burnet, of Newark, New Jersey, was a member of the Committee of Public Safety of that Colony, and was made Surgeon General of the militia, February 17, 1776. His son, Ichabod Burnet, was an aide of General Greene. When Mrs. Washington journeyed to Cambridge in 1775 she stayed at the house of Dr. Burnet in Broad Street. He was Physician and Surgeon General of the Eastern Department, April 11, 1777, and Hospital Physician and Surgeon, Oct. 6, 1780; and Chief Hospital Physician and Surgeon, March 5, 1781 to the end of the war. He was stationed at West Point at the time of Arnold's treason; after the war, was president of the State Medical So-

ciety, and Judge of the Court of Common Pleas. A son, David Burnet, became President of Texas. Dr. Burnet died October 7, 1791.

14.—RESOLUTION OF CONGRESS.

Resolved. That no regimental hospitals be in future allowed in the neighborhood of the general hospital.

That John Morgan, Esq., provide and superintend a hospital at a proper distance from the camp, for the Army posted on the east side of Hudson's River.

That William Shippen, Esq., provide and superintend a hospital for the Army in the State of New Jersey.

That each of the hospitals be supplied by the respective directors, with such a number of surgeons, apothecaries, surgeons' mates and other assistants; and also with such quantities of medicines and bedding, and other necessaries, as they shall judge expedient.

That they make weekly returns to congress, and to the Commander in Chief, of the officers and assistants of each denomination; and also the number of sick and deceased, in their respective hospitals.

That the regimental surgeons be directed to send to the general hospital such officers and soldiers of their respective regiments, as confined by wounds, or other disorders, shall require nurses or other attendance, and from time to time apply to the Quartermaster General, or his deputy, for convenient wagons, for their purpose; also, that they apply to the directors in their respective departments for medicines and other necessaries.

That the wages of the nurses be augmented to one dollar a week.

That a commanding officer of each regiment, be directed once a week to send a commissioned officer, to visit the sick of his respective regiment, in the general hospital, and report their state to him.

CHARLES THOMPSON, Secretary.

15.—LETTER OF WASHINGTON TO CONGRESS.

Before I conclude I would beg leave to mention to Congress, that the pay now allowed to nurses for their attendance on the sick is by no means adequate to their services—the consequence of which is that they are extremely difficult to procure; indeed they are not to be got, and we are under the necessity of substituting in their place a number of men from the respective regiments, whose services by that means is entirely lost to the proper line of their duty, and but little benefit indeed to the sick. The officers I have talked with upon the subject all agree that they should be allowed a dollar a week, and that for less they cannot be had. Our sick are extremely numerous, and we find their removal attended with the greatest difficulty. It is a matter that employs much of our time and care, and what makes it more distressing, is the want of proper and convenient places for their reception. I fear their sufferings will be great and many; however nothing on my part that humanity or policy can require shall be wanting to make them comfortable, so far as the state of things will permit it.

I have the honor to be &c.

GEO. WASHINGTON.

16.—TO DOCTOR BENJAMIN RUSH MEMBER OF THE
MEDICAL COMMITTEE OF CONGRESS.

Sir: By command of General Washington, all the sick and wounded, both in the general hospital and those remaining under the care of regimental surgeons, are removed within two days, to this side of the river, and chiefly in this neighborhood. They amount to several hundreds, in addition to about 300 who were before removed to Newark, and 4 or 500 in Orange County.

The general's commands were to leave a respectable body of surgeons and mates above Kingsbridge, a general action being daily expected, as the whole force of the enemy is drawn to that quarter.

So soon as I get this part of the general hospital into order I am to return and provide accommodations at the White Plains, for which indeed I gave the necessary orders before I came over.

JOHN MORGAN.

17.—CIRCULAR LETTER.

To the regimental surgeons and mates, belonging to the Army of His Excellency, General Washington, now absent with, or without the sick of their respective regiments and brigades, on either side of Hudson River. Gentlemen:

Few of the surgeons or sick, allowed to remove from camp some time ago, being yet returned, and no report being made of them to me, His Excellency the Commander in Chief, conceives that his former indulgence to the sick, in permitting them to retire from the camp for the recovery of their health, has been much abused both by the sick and the generality of the surgeons and mates, under whose care they were allowed that indulgence; it is His Excellency's orders, therefore, that each of you do forthwith wait upon Isaac Foster, Esq., at Hackensack; John Warren, Esq., at Newark, or Philip Turner, Esq., at Norwalk; Surgeons in the general hospital, whoever of them is nearest at hand, and make a faithful and accurate report of the sick and wounded under your care, and remove those who are fit subjects, immediately, to the general hospital, under their care; for which you are to apply to the quartermaster general's dept. for wagons, and accompanying them yourselves

Such of you as those gentlemen require to assist them for the present in the general hospital, and who are willing to attend to their sick there, under their direction, are allowed to do so till further orders; all others are to repair immediately to headquarters, and join their respective regiments: first furnishing me with an accurate register, duly certified, of the state of the sick that went out with them, or have been since under their care, specifying the time of their being taken ill, their diseases, and events as to death, recovery, or continuance; and whether any of the sick have been allowed to withdraw from under their care, and when.

As all who are absent without leave must naturally be looked upon as deserters. And the surgeons, or mates, who cannot give a regular and satisfactory account of the faithful discharge of their duty, necessarily subject themselves to an inquiry into their conduct.

JOHN MORGAN.

18.—Philip Turner was born at Norwich, Connecticut in 1740. Being left an orphan at twelve, he was taken into the family of Dr. Elisha Tracy and in time studied medicine. In 1759 he was an assistant surgeon with a provincial regiment at Ticonderoga: continuing with the army until 1763. At the beginning of the war he stood at the head of his profession, but left his practice to become surgeon of Huntington's Regiment (8th Connecticut, later the 17th Continental). He was at Boston, accompanied the army to New York, and was at Long Island and White Plains. In 1777 he narrowly missed being made Director General instead of Dr. Shippen. He was a little later made Surgeon General of the Eastern Department; and served as such until near the end of the war. He then returned to Norwich and resumed practice. In 1800 he removed to New York City, and later was appointed a staff major in the army, with station at Governor's Island. He held this position until his death in 1815.

19.—Dr. James McHenry was born in Ireland in 1753, came to America in 1771, studied medicine in Philadelphia under Dr. Benjamin Rush, but does not appear to have graduated from the Medical College. He was made surgeon of the 5th Pennsylvania Regiment on August 10, 1776, and was taken prisoner at the capture of Fort Washington, November 16, 1776. He was on parole until exchanged, March 5, 1778. In May he was appointed secretary to General Washington, and this ended his medical career. On May 25th he was commissioned a major in the Continental Army. In 1780-81 he was an aide-de-camp to LaFayette. After the war he was a member of the Maryland Legislature. He was Secretary of War from January 29th, 1796, to May 13, 1800. Fort McHenry, Baltimore, the scene of the incident giving rise to the writing of The Star Spangled Banner, was named in his honor. He died May 8, 1816.

20.—John Beatty was a native of Bucks County, Pennsylvania, where he was born in 1748, but received his education in New Jersey and lived in that State for forty years. He graduated from Princeton College in 1769, and afterward studied medicine under Dr. Rush. Like many other medical men, at the beginning of the war he exchanged the civilian dress of the surgeon for the regimentals of a line officer. By September of 1776 he had reached the rank of lieutenant colonel. Fickle fortune placed him in one of those Pennsylvania regiments selected to defend Fort Washington. As they were unable to defend it, he became a prisoner of war, and as such endured great hardship and suffering. He was not released until his health had entirely failed, requiring several years for restoration. Not until 1779 was he able to resume active duty. He was then appointed Commissary General of prisoners, which position he is believed to have held until the close of the war.

[Notes 21, 22 and 23 have been omitted, owing to lack of space; they will appear in the author's reprints. Notes 21 and 22 comprise a letter from General Heath to Dr. Morgan and Dr. Morgan's reply; Note 23 embodies the resolution dismissing Dr. Morgan from the service. EDITORS.]

Editorial Notes and Comments

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OCULAR ACCIDENTS ATTRIBUTED TO ARSENICAL PRODUCTS.

The arsenical compounds, both mineral and organic, have been the cause of various accidents, but ocular disturbances attributed to these products are the most serious of all. The arsenical products that have produced slight ocular accidents having a good prognosis are the cacodylates and sodium and potassium arsenate; those producing serious disturbances are atoxyl, arsacetine, hectine and hectargyre, as well as salvarsan and neosalvarsan.

Regardless of the very extensive use made in recent years of the cacodylates lesions of the optic nerve have never been recorded. The few cases reported of optic neuritis following the internal exhibition of sodium or potassium arsenate have been neuritides presenting the type of toxic neuritis or infectious neuritis with a central scotoma, without any change in the peripheral visual field but offering a slight irregularity in the outline of the papilla. The prognosis is favorable in these cases.

Atoxyl produces complete and incurable atrophy of the optic nerve following a retrobulbar neuritis, the symptoms being a narrowed visual field, decrease of the pupil reflex, white papillæ and a narrowing of the vessels of the retina. Arsacetine acts in the same way only its toxicity is somewhat less. Hectine and hectargyre produce identical lesions of the optic nerve but nevertheless not so serious as those resulting from atoxyl.

However, all things considered, ocular complications have been reported too frequently from these

products so that preference should be given to salvarsan, arsenobenzol or neosalvarsan. The ocular accidents attributed to salvarsan may be placed in three categories, namely, accidents in the uveal tract, those of the optic nerve, and accidents arising in the motor nerves, the globe of the eye, and the eyelids.

The accidents arising in the uveal tract—iritis and choroiditis—attributed to salvarsan are, in reality, merely syphilitic manifestations and are not the result of the drug. Their early appearance is proof of this. Likewise, the optic neuritis attributed to salvarsan would seem also to be of a syphilitic nature; it is neither more frequent in occurrence nor earlier in appearance than before salvarsan came into use.

As to the disturbances of the motor nerves of the eye they are simply manifestations of the syphilitic virus and cannot be attributed to salvarsan. The cases recorded by Bizard, Sicard, Guttmann, and others were due to meningeal phenomena which reacted upon the cranial nerves as might be expected; these meningeal phenomena were noted at the very onset of the syphilis and before treatment with salvarsan had been given.

It is also safe to assume that what has been said of salvarsan applies as well to neosalvarsan, arsenobenzol and other recent products of arsenic, and that with very small doses repeated daily or every second day, either subcutaneously or intravenously, no accidents of any description need be feared.

SLEEPING SICKNESS.

Sleeping sickness has been confounded to some extent with encephalitis lethargica. When the latter condition was somewhat prevalent in this country, the daily journals usually referred to it as sleeping sickness. According to H. L. Duke the date of commencement of the great epidemic of sleeping sickness on the shores of Lake Victoria is difficult to determine. The attention of Europeans was first drawn to the disease in 1901, but inquiry among the Buganda chiefs revealed the fact that *mongota*, the native name for the disease, existed previous to this date in endemic form. In 1906 Sir H. Hesketh Bell proposed a scheme for dealing with the malady which was put into execution. Segregation of the infected was the principle of this scheme and was commenced in 1906, and by the end of 1907 the mainland population had been removed inland for a depth of two miles from the coast. These measures were enforced only within the limits of the Uganda protectorate.

Different means of endeavoring to extirpate the disease prevailed in the adjoining fly areas of German East Africa and British East Africa. The Germans combined deforestation measures with a limited depopulation scheme applied to certain dangerous localities. In British East Africa the natives were left in contact with the flies, an attempt to encourage voluntary segregation and isolation proving abortive. Along the shores of the Kavirondo Gulf, the epidemic apparently worked itself out after causing a very heavy mortality. The disease in this area now appears to be endemic and the population is reported to be increasing. As for German East Africa, the authorities there described the measures taken as completely successful yet admitted that isolated cases of fresh infection occurred from time to time.

Concerning the part played by the tsetse flies in the transmission of the infection, as a result of most careful and critical examination of all available information with regard to the Uganda epidemic Duke brings forward the hypothesis that mechanical transmission from man to man of a virulent strain of *Trypanosoma gambiense* played a most important part. He points out that the conditions necessary for direct transmission, viz., the presence of many large biting flies and of many potential hosts of the parasite in close juxtaposition, were fulfilled in the closely packed canoes of Victoria Nyanza. However, the chief point raised by Duke is as follows:

While it appears that segregation had its effect in Uganda, in preventing the spread of the disease, nipping it in the bud in fact, does it follow that those responsible for the direction of affairs in that district of Africa are justified in accepting the most obvious interpretation and proceeding to reconstructive effort on the assumption that an epidemic of sleeping sickness is impossible unless there is sufficient contact between the flies and the population to render possible the development of a virulent mechanical transmission strain, or must the possibility also be taken into account that the pathogenicity of the trypanosome may be subject *per se* to variations, irrespective of the method by which it is transmitted? On the latter explanation the disappearance of acute trypanosomiasis in Uganda is not altogether due to the preventive measures but also in greater or less degree to diminution in pathogenicity of the parasite, and the trypanosome is likely to resume a virulent state, even in Uganda, under existing conditions. Duke, therefore, considers that further specific inquiry is needed to elucidate the question. Reading the results of such inquiry the following hypothesis affords the best answer that can be given to what may be regarded as the

main question. It recognizes the possibility that the trypanosome may vary greatly in pathogenicity to man; it takes into account the manner in which peculiarly virulent strains of normally less virulent species of insect borne trypanosomes are developed; it recognizes also the real probability that such strains may develop in nature as well as in the laboratory; it recognizes a clear possibility that a peculiarly virulent strain of trypanosome may have been developed in this manner; and finally, if it could be proved well founded, it would indicate that very broad contact between the flies and the population is a prime essential to the occurrence of sleeping sickness in the form of a widespread epidemic. The inquiry recommended by Duke should be valuable not only with regard to sleeping sickness but with respect to other insect borne diseases and perhaps disease generally of an infective character.

PHYSICIAN AUTHORS—JOHN LOCKE.

The most important figure in English philosophy is Dr. John Locke, a physician whose *Essay on Human Understanding* has been, ever since its publication in 1690, one of the two fountain heads of modern philosophy. The other is Kant's *Kritik of Pure Reason*. What Kant is to German philosophy Locke is to English. These are the two giants of modern philosophy. Locke's *Essay*—that is all the title it generally gets in discussion—gave a new direction to European philosophy and provided a new basis for the science of psychology. It opened a better and clearer way to reasoning. John Stuart Mill, Locke's spiritual descendant, called Locke the "unquestionable founder of analytical philosophy of the mind," and D'Alembert says: "It may be said that he created the science of metaphysics, for he reduced metaphysics to that which it ought to be, viz., the experimental physics of the mind." Henry Hallam is equally enthusiastic. He describes the essay as "the first and most complete chart of the human mind laid down; the most ample repertory of truths relating to our intellectual being and the one book which we are still compelled to name as the most important in metaphysical science."

But the essay has its inconsistencies and these have been assailed as hotly as its truths have been defended. It is not the individual doctrines, however, that give it its superiority. Many of these have succumbed to hostile criticism. The excellence lies rather in the general drift and the direction it gave to the philosophical studies of others. "There is hardly a single French or English writer (and we may add Kant) . . . who does not profess either to develop Locke's system, or to supplement,

or to criticise it," says Thomas Fowler. In short, around this essay a whole literature of attack and defence has arisen. "He suggests as much as he teaches," says George Henry Lewes, and it is not to be denied that the essay opened up vast tracts of thought and has had an enormous influence, despite its weaknesses.

It took Locke twenty years to write this splendid textbook of what has been called "the noblest branch of human learning." Twenty years of concentration and toil whenever he had the time, and he got only thirty pounds for the copyright. Purchase of the most renowned treatise of its time, the greatest book of its generation, for a miserable pittance of thirty pounds! Many an author today would spurn this amount if it were offered for a trifling short story sketched during one weekend and completed before another.

George Henry Lewes says Locke's education as a physician fitted him for the meditation necessary to write the essay, and other writers have assured us that his medical observations had a powerful influence on his speculative studies. Locke was one of the most renowned physicians of his day, although he was one of the late blooming variety. It was not until he was forty-two years old that he took his degree of Bachelor of Medicine, in 1674. This was because when he first went to Oxford he studied theology, and it was only after several years of classical and theological study that he determined to be a physician. His chronic ill health also delayed his medical studies. He was afflicted with lung trouble and on two occasions had to take extensive rests in southern France. It was his good fortune to have a lord as his first patient, Lord Ashley, afterwards Lord Shaftesbury, whose life he saved. The two were fast friends forever after and their names are linked in politics, in which Locke took such an active interest that he had to flee to Holland, where he spent five years in exile under the assumed name of Dr. Van der Linden. It was while he was in Holland that he completed the essay. His exile weighed heavily upon him, we are told, but at the end of it fortune smiled upon him and through the influence of friends he held several highly paid government positions.

The *Essay on Human Understanding* was but one of many writings on which Locke's fame rests. He wrote four other philosophical treatises of lesser consequence, five on Christianity, eight on social economy, five on education and several on miscellaneous subjects. Perhaps second in importance was his *Essay on Tolerance*, in which he is credited with having uttered more good sense on the subject of religious tolerance than is found in the works of

any preceding writer. It came at a time when the spirit of toleration and charity in religious differences was badly needed and it wrought much improvement. Carlyle said of it that "it paved the way for banishing religion from the world," but that, perhaps, may be an overappreciation of its influence. By means of his *Essay on Education* Locke became a great educational reformer, changing the whole attitude of English and continental society toward the subject. His *Essay on Government* diffused throughout the world the love of civil liberty. This essay was the first on which his name appeared. *The Essay on Tolerance* and many of the others appeared anonymously.

John Locke was born in Somersetshire, England, on August 29, 1632, six years after the death of Bacon, and died in 1704 at the age of seventy-two. In the inscription on his tomb, prepared by himself, he refers to his books as a true representation of what he was. "If we consider his genius and penetrating and exact judgment, or the strictness of his morals, he has scarce any superior and few equals," said Dr. Thomas Sydenham, the famous physician after whom the Sydenham society was named, in his *Medical Observations*.

THE BRITISH NATIONAL INSURANCE ACT.

It was shown at the recent meeting of the British Medical Association that much discontent prevails among the members of the British medical profession generally with regard to the National Insurance Act. Perhaps it is not so much a question of remuneration, although the pay of panel practitioners is by no means too liberal, as the comparative loss of independence and the fear that they may be under the thumb of the societies. The British medical profession is almost a negligible quantity politically, whereas the societies are immensely powerful. The societies are antagonistic to the medical profession, regarding its members as belonging to the privileged classes. In the *Medical Press*, August 25th last, is an article entitled *Some Thoughts on the National Health Insurance Act and the Panel*, by Dr. James Hamilton, who gives an opinion of the matter which probably is also the opinion of many a practitioner. The main objection that the writer brings against the panel system is the loss of liberty and individuality that the doctor suffers. He points out that new rules and regulations and new rulers and a new agreement came along on April Fool's day, and since then a new act, which is like its predecessor in being only a skeleton to be completed by orders in council and regu-

lations. The panel practitioners are therefore ignorant of what is in store for them in the future. The writer goes on to point out that if there was anything like accurate bookkeeping between the societies and the insurance committees it ought to be possible, seeing that the act has been in force for about seven years, for an insurance committee to be able to tell the doctor that there are so many on his list at the end of each quarter and so much a quarter will be paid for each one.

The act simply bristles with absurd and irritating regulations, but the great objection to it from the medical man's point of view is that he is, to some extent, now under the domination of the approved societies, and it looks as if this domination would not grow less but greater. Many medical men fear that it is the insertion of the thin edge of the wedge leading to nationalization of the medical profession, and when the labor representative who attended the meeting of the Sociological Section of the British Medical Association, held recently in Cambridge, stated outright that he was in favor of nationalizing the profession, this fear appeared to be justified. There has been much talk in the United States of late of having an insurance act and placing a goodly proportion of the medical men on a similar status to that held by the panel practitioners of Great Britain. It will be as well if doctors here move cautiously, and make sure that they are not sacrificing liberty before pledging themselves to any such course. It is better to endure the ills we know, than to fly to those we wot not of.

OSLER MEMORIAL NUMBER.

What will prove a valuable historical publication in the medical world is the Sir William Osler Memorial Number of the *Canadian Medical Association Journal* of July, 1920. There are several portraits of Sir William, notably one at the time he was prefect in Trinity College School; Osler as a student of medicine at McGill University in 1871; the handsome, debonair Osler in 1881; Osler at Oxford in 1908. Relatives, personal friends, classmates, students, distinguished men of science, confrères in practice, faculty associates have contributed to this volume which should have been presented to the profession in other than regular journal covers.

There is a foreword by Dr. Francis J. Shepherd, classmate and lifelong friend; the memorial sermon by the Reverend H. Symonds, Christ Church Cathedral, Montreal; biographical sketch by Francis J. Shepherd; Osler's boyhood by a nephew, Dr. Norman Gwyn, Toronto; Montreal days by Dr. A. D. Blackader, Montreal; Osler and the Montreal Veterinary College; a tribute to Sir William Osler by Dr. W. W. Keen; early days at Johns Hopkins Hospital by H. A. Lafleur, Montreal; A

Student's Impression of Osler by W. G. MacCallum; Sir William at Oxford by Archibald Malloch; Sir William and Oxford by two friends; Last Days of Sir William Osler by J. George Adami; The Influence of Sir William Osler on Medicine in America by Thomas McCrae; Osler as Clinician and Teacher by Charles F. Martin; Sir William Osler and the McGill Medical Library by Jean Cameron; Osler's Influence on the Research Student by A. B. MacCallum; The Pathological Collections of the late Sir William Osler and His Relation With the Medical Museum of McGill University by Maude E. Abbott; a Classified Bibliography of Sir William Osler's Canadian Period (1868-1885) by Maude E. Abbott.

REFINED GENEROSITY.

In these days of frequent moving from street to street, from earthly mansions to heavenly mansions, there are always stacks of medical books awaiting a fixed destination by the ignorant women of the household left mourning the doctor, or the hurried decision of a tired man. If worldly wise he will not give first editions, nor the latest. He will not give reprints sent from great men. These are marketable, and besides the medical students of some small town would not appreciate them. So the doctor who is glad to get the credit of being generous and at the same time placate his wife by clearing out those "horrid old books," gathers his second and third editions, his loosely tied up piles of reprints, his volumes by faddists, his piles of journals whose numbers containing valuable articles are missing, and dumps them down in the small library addressed to the resigned, sorrowful librarian who knows their worth before she unpacks them and contemplates a larger laundry bill because of their dustiness. Is this generous?

The same thing is done to medical missionaries. These men often go out from big centres where they had the most recent in medical literature. A generous doctor is asked for books, and, he, regarding missionaries as long bearded old gentlemen raised on the literature of 1850, sends a box which only provokes Christian substitutes for curses. They do not even get any amusement, as the soldiers did when a lady sent in a gift box to the Red Cross with the Dolly Dimple Series and some books on baby treatment for young mothers.

Now how much better if the overbooked doctor would send one or two new editions of well known works, or a goodly pile of reprints with cases, or a year's subscription to a medical society's journal or transactions not usually seen in small libraries. Personally I have always found most generous response to a direct appeal to our leaders in science for their own works, but a circular note is usually handed over to a secretary, only too glad to clear out the shelves. It will require some little thought, some selfdenial to send the book hungry doctor what he needs, but those who have known the pleasant feel of a new book, the certainty of finding what is wanted in it, surely will not again send those bulky, unprofitable selections to their poorer brothers.

News Items.

Cholera in Corea.—Cholera is said to be spreading rapidly in Corea. According to a press dispatch from Seoul, on September 22nd there were 20,000 cases of cholera and more than 9,000 deaths from the disease.

New Medical Publication.—Dr. Piétri, director of the French hospital in Athens, is the editor of a new Greek medical journal, *Iatrikos Typos*, the monthly publication of the French hospital and of the Pasteur Institute of Athens.

German Universities.—A note in the *Paris médical* states that a new university has been established at Cologne, that the University of Bonn has been enlarged, and that new departments have been added in several other German universities.

Pacific Coast Oto-Ophthalmological Society.—The annual meeting of this society was held July 29th and 30th at Portland, Ore. The following officers were elected: President, Dr. George W. Swift, of Seattle; vice-presidents, Dr. E. E. Maxey, Boise, Ida.; Dr. J. O. Chapelle, of Chico, Cal.; secretary-treasurer, Dr. E. E. Wheeler, of Tacoma.

Infantile Paralysis Here.—Following the epidemic of anterior poliomyelitis in Boston and its appearance at other points in the state, the disease has now made its appearance in New York City. Three cases and one death were reported in one day, September 24th. Massachusetts had ninety-four cases in August and 134 during the first twenty-four days of September.

Shanghai Medical School Project Abandoned.—The China Medical Board of the Rockefeller Foundation recently decided to abandon its project for the establishment of a medical school at Shanghai. A reason for this change is the unexpectedly high cost of all the Board's enterprises in China, the Peking Union Medical College having cost larger sums than it had been thought in 1914 would be necessary for both schools. In addition, the capacity of the Peking school has not yet been reached.

Traumatic Neurosis Committee.—A committee has been appointed in England to "consider the different types of hysteria and traumatic neurosis, commonly called 'shell shock' to collate the expert knowledge derived from the service medical authorities and the medical profession from the experience of the war, with a view to recording for future use the ascertained facts as to its origin, nature, and remedial treatment and to advise whether, by military training or education, some scientific method of guarding against its occurrence cannot be devised." Lord Southborough, G. C. B., is chairman.

Institute of Psychology of Paris.—A psychological institute is to be established at the University of Paris associated with the *Facultés des Lettres et des Sciences*. Professors H. Delacrois, G. Dumas, P. Janet, H. Piéron and E. Rabaud will form the council of directors. The institute will undertake the practical and theoretical teaching of all branches of psychology—physiological, experimental, pathological, comparative, and general, and research can be carried out in the laboratories in preparation for university degrees. The diploma course will consist of two terms.

International Institute of Anthropology.—At a meeting held September 9th to 14th in Paris, there was held a conference looking toward the establishment of an international institute of anthropology. A permanent office was created to organize periodical meetings. Subjects taken up at the preliminary meeting were means of organizing inquiries and unification of means of investigation and measurement.

Proposed Coordination of British Hospitals.—The British Red Cross has proposed a plan for coordinating all the hospitals in England and Wales, so that the working population throughout the country may have the benefit of the best possible medical care. It is the object of this projected organization to reduce the expenses and increase the revenue of hospitals. The Red Cross offers to assist voluntary hospitals by affording them the advantages of a big organization, as in some cases their finances do not permit of their making all the necessary modern improvements.

Hoover Seeks Aid for European Children.—The feeding of destitute European children has again become urgent because of inadequate harvests in many countries, and Mr. Herbert Hoover has taken up with various welfare organizations the problem of caring for them. Reports from agents of the American Relief Administration indicate that about two million children in Austria, Czecho-Slovakia, Poland, and Baltic States, and other regions are in need of food and clothing. The American Relief Administration formerly fed six million children, but its funds will be exhausted by January 1st and its chief activities have been turned over to other agencies.

Pathological Congress.—The second international congress of comparative pathology, which was to have taken place in 1914, will be held in Rome in April, 1921, under the presidency of Professor E. Perroncito. The preliminary program announces the subjects for discussion as influenza of man and animals, cancer and sarcoma, rabies and the results of Pasteurian vaccination, plague among ruminants, chicken pest and bee pest, evolutionary cycles of *Dibothriocephalus latus* and *Ascarides*, scabies of man and animals, nerve regeneration, vegetable symbiosis, and parasitism. Pathologists or others wishing to attend should communicate with the general secretary, Professor Mario Levi della Vida, at 58, Viâ Palermo, Rome.

Spanish Antimalaria Campaign.—The League of Red Cross Societies, in agreement with the Spanish Government and the Spanish Red Cross, has decided to undertake an antimalaria campaign in Spain.

The mission which was sent to investigate malaria had as its chief Dr. Massimo Sella, chief of the Department of Malaria of the League. Major Stuart, assistant chief of the Department of Sanitation; Dr. Huntington Williams, of the League staff, and Mr. Juan Larrosa chief of the Spanish section of the Department of Publicity and Publication. At Madrid the mission was joined by Professor Pittaluga, an authority on the subject of malaria. The mission began its work during the first two weeks of August.

American Electrotherapeutic Association.—At the twentieth annual meeting of the American Electrotherapeutic Association, held September 14th to 17th at Atlantic City, the following officers were elected: President, Dr. Byron Sprague Price, of New York; vice-presidents, Dr. V. C. Kinney, of Wellsville, N. Y.; Dr. C. M. Sampson, of St. Joseph, Mo.; Dr. Charles Collins, of Washington, D. C.; Dr. D. A. Cater, of East Orange, N. J.; Dr. W. T. Johnson, of Philadelphia; trustees, Dr. F. B. Granger and Dr. F. H. Morse, of Boston; Dr. W. M. Clark of Philadelphia; Dr. William Martin, of Atlantic City; Dr. Frederic deKraft, Dr. E. C. Titus and Dr. J. W. Travell, of New York; secretary and registrar, Dr. A. Bern Hirsh, of New York.

Local Society Meetings.—The following local Mercy, St. Joseph's, Morrow and University medical societies will meet during the coming week:

Monday, October 4th.—New York German Medical Society.

Tuesday, October 5th.—New York Academy of Medicine (Section in Dermatology and Syphilis), Clinical Society of Harlem Hospital, New York Neurological Society, Society of Alumni of Lebanon Hospital.

Wednesday, October 6th.—New York Academy of Medicine (Section in Historical Medicine), Bronx Medical Association, Harlem Medical Association, Psychiatric Society of New York, New York Urological Society, Society of Alumni of Bellevue Hospital, Brooklyn Society for Neurology.

Thursday, October 7th.—New York Academy of Medicine (stated meeting), Brooklyn Surgical Society.

Friday, October 8th.—New York Academy of Medicine (Section in Otolaryngology), Eastern Medical Society of the City of New York, Flatbush Medical Society.

Saturday, October 9th.—Medical Officers' Reserve Corps Association of the United States Army, New York Division.

Medical Corps Examinations.—Another examination will be held October 25th to 31st, to determine the eligibility for appointment of applicants for the Medical and Dental Corps of the Regular Army. Persons of the following classes who served as officers of the United States Army at some time between April 6, 1917, and June 4, 1920, are eligible to take this second examination:

1. Those who for any good reason did not apply and were not authorized to take the July examinations.
2. Those who were authorized to take the July examinations but who for some good reason were unable to appear before the examining boards.
3. Those who were authorized to take the July examinations and who appeared before examining boards but who for some good reason of their own volition or through illness or accident failed to complete the examination.
4. Those examined during the July examination who were found disqualified on account of physical defects which have been removed by operation or which do not exist at the time of the October 25th examination.

The examination will not be competitive. The number of vacancies in the Medical Corps is sufficient to provide for any reasonable number of applicants who may qualify for appointment. The reference in War Department announcement limiting appointments to be made to 200 does not apply to the Medical Department. As in the past, the military record and general efficiency of the officer will be determining factors for appointment. Candidates must be fifty-eight years of age or under and meet the physical requirements fixed by the War Department. Blank application forms may be obtained from the Adjutant General of the Army or at any military post or station.

Anesthesia Record.—The National Anesthesia Research Society has adopted a uniform chart, which it recommends for use in all hospitals. The committee, consisting of Dr. A. H. Miller, of Providence; Dr. E. I. McKesson, of Toledo, and Dr. A. F. Erdmann, of Brooklyn, studied and compared charts from all leading hospitals and clinics of the United States and the resulting chart is designated to embrace all the essential points in the administration of an anesthetic. The society will print and distribute the chart at cost to all hospitals using it.

Venereal Diseases Conference.—The All-America Conference on Venereal Diseases, to be held December 6th to 11th in Washington, D. C., under the presidency of Dr. William H. Welch, of Johns Hopkins University, is the first of a series of regional conferences suggested by the International Health Conference held at Cannes under the auspices of the League of Red Cross Societies. The administrative committee consists of Dr. Thomas A. Storey, United States Interdepartmental Social Hygiene Board; Dr. C. C. Pierce, United States Public Health Service; Dr. Livingston Farrand, American Red Cross, and Dr. William F. Snow, American Social Hygiene Association. Subjects to be discussed are: Present status and recent progress in medical investigations; education as a means of controlling venereal diseases; law enforcement and protective social measures with individuals; social influence in the control of venereal diseases; administrative measures in the United States, Canada, Latin-America, and other countries. The conference will endeavor to adopt recommendations relating to a practicable three year program for each of the North and South American countries participating and to suggest plans for putting such programs into effect.

Died.

ANDREWS.—In Philadelphia, Pa., on Friday, September 17th, Dr. Reuben H. Andrews, aged seventy years.

BOIES.—In East Aurora, N. Y., on Friday, September 17th, Dr. Loren F. Boies, aged eighty-four years.

BRODNAX.—In Brooklyn, N. Y., on Tuesday, September 21st, Dr. Robert Brodnax.

DILLON.—In Holyoke, Mass., on Sunday, September 12th, Dr. John Aloysius Dillon, aged forty-two years.

JENKINS.—In Saranac Lake, N. Y., on Saturday, September 18th, Dr. Elisha Averett Jenkins, aged forty-six years.

LEFFERTS.—In Katonah, N. Y., on Tuesday, September 21st, Dr. George Morewood Lefferts, aged seventy-four years.

MARSHALL.—In Philadelphia, Pa., on Monday, September 20th, Dr. Anna M. Marshall, aged eighty years.

PAIST.—In Philadelphia, Pa., on Tuesday, September 21st, Dr. Henry Carver Paist, aged eighty-seven years.

STUART.—In Minneapolis, Dr. John Harlan Stuart, aged eighty-four years.

THOMSON.—In Glens Falls, N. Y., on Wednesday, September 15th, Dr. Lemon Thomson, aged sixty-three years.

URQUHART.—In Los Gatos, Cal., on Saturday, September 4th, Dr. Richard Alexander Urquhart, aged seventy years.

VAN DERZEE.—In Dannemora, N. Y., on Thursday, September 16th, Dr. Douw Lansing Van Derzee, aged forty-eight years.

VAN PATTEN.—In Los Angeles, Cal., on Wednesday, September 15th, Dr. Philip S. Van Patten, aged forty-eight years.

Book Reviews

FORESTRY AND HEALTH.

Forests, Woods, and Trees in Relation to Hygiene. By AUGUSTINE HENRY, M. A., F. L. S., M. R. I. A., Professor of Forestry, Royal College of Science, Dublin. Illustrated. New York: E. P. Dutton & Co. Pp. xii-314.

Trees for beauty and tree shade for lovers' meetings, trees for healing, trees to build rough huts and to beautify the inside of palaces; trees to build wave conquering ships and frolicsome canoes; trees to bear men far above the highest mountains in air planes; trees to fashion man's last resting place, his narrow wooden home. Hack at them, make long planks, squeeze out their life blood, take even their dust, and from first to last all in them and of them feeds the ever turning wheel of production and usefulness. The traveler sees the forest crowned hills, the miles of forests, the tiny steamers dragging thousands of tree trunks to the saw mills and thinks, if he thinks at all, that there is plenty of wood in the world.

But war and forest fires, tiny insects and ravaging storms, the greed of man who despoils for the present and plants not for posterity, are making a change in woodlands appreciable even to the thoughtless, and, like the unwise virgins, nation is saying to nation, "Give us of your trees, for ours are few; few, because we recklessly, greedily, consumed our store."

What has Augustine Henry to say? He pleads for the trees, not on the grounds of pure utility, but as hygienists in parks and streets, for water catchment areas, as living green to clothe the hideous pit mounds, as hosts to revivify the tired guest who comes to the sanatorium from hot pavements and miles of houses, as gentle creatures who in new surroundings will find a foothold and do their best to conquer, who will use their old summer clothes to make winter counterpanes for their feet and guard the seedlings of spring beauties from harsh frosts. All this he says of trees in general; he then tells of the various kinds used as healers, where they abound, what they like, where they will thrive and what wonderful guards they will form against sun and wind and raging storm. In studying the influence of forests on temperature it was found that a richly afforested country has a lower temperature in summer, and that the effect of local afforestation is to increase the rainfall. Forests also have a restraining influence on the melting of snow and so retard streamflow at a time when floods are most frequent.

As to the sanitary influence of forests, their advantage in windswept districts is incalculable. The chilly effect of the peat bogs in Ireland and Scotland giving rise to severe spring frosts is well known. Plantations of spruce, maritime pine, Scotch pine and larch would obviate all this. Forests depress the level of the underground water and effectual draining can be done by planting trees, eliminating those marshy places which breed mosquitoes. Napoleon was always ready for suggestion and stayed the malaria in north Africa by those groves of rapidly growing eucalyptus which delight the present residents. But the most important asset is that smoke, dust, injurious gases and

bacteria are rare or absent in the air of forests. Indian villages surrounded by forests are never visited by cholera. The greatest example is that of the Landes in Gascony, once a bare, marshy district subject to malaria and pellagra. Since 1850 some 1,800,000 acres have been planted with maritime pine, and these diseases have practically disappeared.

Good pictures, in print and photos, are given of some of the famous sanatoria, such as Nordrach, Brompton Hospital, Frimlay, etc., dwelling on the effect of trees as wind guards and as forming winter walks but cautioning avoidance of too great crowding near the house itself. He admits the curative effect of the volatile pine oil but says that no scientific studies from a therapeutic point of view, have ever been attempted, Professor Hamburger, of Gröningen University, having gone the furthest.

There is much wise counsel as to town planting, and here he has something to say about desirable aliens. In England, the black walnut and the tulip tree and the *Robinia pseudacacia* are successful, and the London plane (*Platanus acerifolia*) is the street tree which grows best, not only in England, but in Europe and the United States. Birch and poplar grow well in heavy clay soils. Scarcely any conifers succeed in smoky towns, the best being the Austrian and the Corsican pines. He points out that pruning is a surgical operation and a necessity with town trees, therefore advises expert pruners as being more economical in the end.

The afforestation of hideous pitmounds has been triumphantly proved a success. The Black Country in England has some 30,000 acres of pit banks. The psychic effect of so much ugliness is big, but the Midland Reafforesting Association is bigger and much has been done. Best of all, the children have been enlisted and supported by the Forestry Board, so two good ends have been attained. The trees which grow best are the alder, birch and Italian poplar. Lessons are given at the school on rainfall, wind force, frost, drought, geology, fungi, insects, and the parents begin to see there "is something in it." In some parts of France little forestry societies have been founded and flourish finely.

Now comes the biggest part of the subject—the water we drink. The afforestation of water catchment areas is not only a hygienic measure but one to increase the timber reserves. This plan of impounding the water falling on upland and sparsely inhabited tracts is in the category with artificial reservoirs, deriving its supply from drainage of surrounding watersheds. In some cases the land is rented, at others purchased outright. The expediency of keeping it uninhabited is contested by Mr. Hazen, especially with regard to the gathering grounds which supply New York and Boston but Dr. A. C. Houston says this can only be done by storage and filtration if habitation is permitted. Afforestation, not necessarily of the whole area, is the best remedy. Questions of aspect, depth, nature of soil, where and what to plant must be considered. On most catchment areas over 1,000 feet elevation, a combination of grazing and fores-

try must be resorted to. When heavy rain comes, the run off water is much lessened; the quality of the water will be better as the soil on the hill slopes will be held together by the roots of the trees, flood waters will be diminished and the reservoirs not silted up. The careful description of the various suitable trees is a most interesting chapter, the pictures excellent. The records from the catchment areas in the British Isles, though local, contain some valuable points applicable to any towns on any continent. We are grateful to Augustine Henry for introducing us to trees as doctors and rural policemen and are sure that when the book was completed, the trees, as in David's time, "clapped their hands for joy."

HISTORY OF NURSING.

A Short History of Nursing. From the Earliest Times to the Present Day. By LAVINIA L. DOCK, R. N., Secretary, International Council of Nurses, in Collaboration with ISABEL MAITLAND STEWART, A. M., R. N., Assistant Professor, Department of Nursing and Health, Teachers' College, Columbia University, New York. New York: G. P. Putnam's Sons, 1920. Pp. vi-392.

Nurse, nourish, to look after the sick and the well; hospital or zenodochium included inns for the well to do, a hospital for the sick, insane and lepers, asylums for foundlings and orphans, alms houses, houses for doctors and nurses, so here we are traveling round to original meanings. A nurse, no longer one who only attends the sick, but a co-operator in public works to ward off disease, a teacher in health, a hygienist, a panacea, a med-trina all in one. The hospital finds its counterpart in the new Central Health Stations, and the reason they endured, at least the ideal was that they were doing their best to fight disease and misery. Their methods were crude, even smile provoking, but their fight was for the truth and every century sees disease and dirt and miserable housing retreating further and further. It was an international fight, Greeks, Hindus, Egyptians, Romans, the enemy never has been tolerated by them and is now far spent. To open the door to Lavinia Dock and Isabel Stewart is to admit an immense throng of workers of all nationalities, of all creeds, giving up everything to clear the road to health for others. It will be a revelation to the budding nurse who thinks that Eve had a trained nurse when Cain was born and that a Red Cross Unit was attendant at the first battle, to learn how very ignorant, how very narrow minded yet how very advanced were ideas far away back and to find there was always a Nightingale in every age to carol a victory strain and always a body of muddle headed, obstinate men who kick against change as an evil thing.

There is one term which might aptly be applied to the book: that is, thorough. We cannot find any lazy scurrying over important periods because information was difficult to find. It furnishes the nurse with correct information, brightly written, and one volume may tempt readers who, tired with the daily routine of nursing, might shrink from the four vols. of the larger *History of Nursing*, yet it may induce others, hungry for details, to embark on the reading of the four.

The fight is not over: in fact, ammunition is being hurried up by the scientists at such a rate that

the nurse's life will be burdened trying to under-stand its use.

Our hospital system often needs remodeling, our nurses need more humane treatment. No stern abbess or sister of ancient times could draw more tears or make toil more unhappy than many sisters of today. Their glance freezes, their nagging is nerve rasping, their sarcasm is blunt, and their daily visit leaves flushed cheeks and uncomplimentary remarks from the dominated.

TEXTBOOK ON INFECTIOUS DISEASES.

Infectious Diseases. A Practical Textbook. (Oxford Medical Publications.) By CLAUDE BUCHANAN KER, M. D. (Ed.), F. R. C. P. (Ed.), Medical Superintendent, City Hospital, Edinburgh, and Lecturer on Infectious Diseases to the University of Edinburgh; Major, R. A. M. C., T. F. Second Edition. Illustrated. London: Henry Frowde, Hodder & Stoughton (Oxford University Press), 1920. Pp. xii-627.

Writers of medical textbooks seldom succeed in taking their readers to the hospitals, to the beds of patients, and presenting the patients, thus giving practical information concerning the proper classification and treatment of disease. Ker, in the second edition of his book on infectious diseases, has accomplished these things.

He has taken his subject material from the City Hospital in Edinburgh and confined himself to the diseases they handle in that institution, which are in reality the bulk of the infectious diseases encountered in general practice. The diseases he has considered are measles, rubella, scarlet fever, smallpox, vaccinia, chickenpox, typhus fever, enteric fever (known in America as typhoid fever), diphtheria, erysipelas, whooping cough, mumps, and cerebrospinal meningitis. Throughout the book Ker has dwelt at great length on the important subjects of diagnosis, prognosis, and treatment. Various theoretical phases of the various diseases are carefully avoided. The aim throughout the book has been to make it useful to the practitioner; useful in an immediate practical way and not in an abstract fashion. The portion of the book dealing with typhoid fever is a most excellent monograph when taken separately. The general tone of the book is not one of uncertainty; the subjects are presented with clarity and directness. The arrangement of the book makes the various sections easily available for quick reference.

BEAUTY.

The Substance of a Dream. Translated from the Original Manuscript by F. W. BAIN. Illustrated. New York: G. P. Putnam's Sons, 1920. Pp. iii-216.

From India, the mystic land of legends and cults founded on phantasy, we have had much that is beautiful. Centuries of grappling with the unknown; an endeavor to create beauty to compensate for crushing circumstances and a soaring in worlds of wonder; countless centuries of silent suffering have led to an acceptance of things as they are. Yet the stoic exterior covered a nimble brain that was creating spirals in an effort to make up for the things that had been deprived. They decorated their temples with the spirals and wove them into the tracery of their stories. They spent little time in portraying reality, for they were surrounded by too much reality and a reality that was too sordid;

they did not have the physical nor the psychic courage to combat the forces which they felt were stronger than any powers they could create from their own ego. Some say there is an awakening today—who can tell. We shall not go into that; we shall only consider some of the products of the day before, when they found their outlet not in trying to better their condition materially but created one in their mind and retreated to the beauties of their own making.

The *Substance of a Dream* is the latest of a series of translations from the original Sanscrit by Bain. These stories sing with a melodious beauty, for they have been retold by a man who felt joy in the telling. The tale is one of love and the pitfalls encountered. Here, as in affairs less emotional, pitfalls and difficulties are encountered along the road and at the turnings. Frequently we recognize our own excursions, though they would require an elastic transformation to the realm of phantasy to cope with the heroic outlines cast by the shadow of the Hindoo participants. But why dwell upon this, for in every story obstacles of one kind or another are encountered. This is as it should be—for the convenience of the tale-teller. It is not here that he quarrels with reality but only in the solution of the difficulties.

One of the dominant notes of the Bain translations, and we may infer that they reflect much Hindoo philosophy, is the rebirth phantasy. Here the great retreat is found. Back to the day of infantile pleasure unmarred by unbending reality. Another chance is called for and the easiest way to realize it, in imagination, is the phantasy of a rebirth. These stories reveal the psychological reaction of a people long held in a bondage of soul and body. And we find the reactions not unlike those of other peoples under similar circumstances. The difficulties found in their love life will be reduplicated and met in the same way in all of the less beautiful phases of life. The stories are of the beautiful and are beautifully told.

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

THE THEORY AND PRACTICE OF MASSAGE. By BEATRICE M. GOODALL-COPESTAKE, Examiner to the Incorporated Society of Trained Masseuses; Teacher of Massage and Swedish Remedial Exercises to the Nursing Staff of the London Hospital. Second Edition. Illustrated. New York: Paul B. Hoeber, 1919. Pp. xxi-265.

THE DIAGNOSIS AND TREATMENT OF HEART DISEASE. Practical Points for Students and Practitioners. By E. M. BROCKBANK, M.D. (Vict.), F.R.C.P., Hon. Physician, Royal Infirmary, Manchester; Lecturer in Clinical Medicine, Dean of Clinical Instruction, University of Manchester. Fourth Edition. Illustrated. New York: Paul B. Hoeber. Pp. viii-158.

THE X RAY ATLAS OF THE SYSTEMIC ARTERIES OF THE BODY. By H. C. ORRIN, O. B. E., F. R. C. S., Ed., Fellow of Royal Society of Medicine, London; Civil Surgeon Attached 3rd London General Hospital, R. A. M. C. (T.). Illustrated. New York: William Wood & Co., 1920. Pp. i-91.

FEMINISM AND SEX EXTINCTION. By ARABELLA KEANEALY, L.R.C.P. (Dublin). New York: E. P. Dutton & Co. Pp. x-313.

TRANSACTIONS OF THE AMERICAN CLIMATOLOGICAL ASSOCIATION. For the Year 1918. Volume xxxiv. Lancaster, Pa. The New Era Printing Co., 1918. Pp. v-294.

THE NEW PSYCHOLOGY AND ITS RELATION TO LIFE. By A. G. TANSLEY. Illustrated. New York: Dodd, Mead & Co. (London: George Allen & Unwin, Ltd.). Pp. v-283.

FORTY-SEVENTH ANNUAL REPORT OF THE COMMISSIONER OF THE MICHIGAN DEPARTMENT OF HEALTH FOR THE FISCAL YEAR ENDING JUNE 30, 1919. Fort Wayne, Indiana, 1920. Pp. 5-196.

LA CURE DE DIURÈSE. Par le Docteur CHARLES RICARD POMARÈDE, Lauréate de Faculté de Médecin, Ex-Interne P. des Hôpitaux de Montpellier, etc. Paris: J. B. Ballière et Fils, 1920. Pp. vii-88.

STUDIES IN NEUROLOGY. By HENRY HEAD, M.D., F.R.S., in conjunction with W. H. R. RIVERS, M.D., F.R.S., GORDON HOLMES, M.D., C.M.G., and several others. In Two Volumes. London: Henry Frowde (Oxford University Press), and Hodder & Stoughton, Ltd., 1920. Pp. ix-862.

HANDBOOK OF DISEASES OF THE NOSE, THROAT, AND EAR. For Students and Practitioners. By W. S. SYME, M. D., F. R. F. P. and S. G., F. R. S. E., Surgeon to the Ear, Nose and Throat Hospital, Glasgow; Extra-Academical Lecturer on Disease of the Throat and Nose, Glasgow University, etc. Illustrated. New York: William Wood & Sons, 1920. (Edinburgh: E. & S. Livingstone.) Pp. viii-329.

A SHORT HISTORY OF NURSING. FROM THE EARLIEST TIMES TO THE PRESENT DAY. By LAVINIA L. DOCK, R. N., Secretary, International Council of Nurses. In Collaboration with ISABEL MAITLAND STEWART, A. M., R. N., Assistant Professor, Department of Nursing and Health, Teachers College, Columbia University, N. Y. New York: G. P. Putnam's Sons, 1920. Pp. vi-392.

INFECTIOUS DISEASES. A Practical Textbook. (Oxford Medical Publications). By CLAUDE BUCHANAN KER, M.D., Ed., F.R.C.P., Edin., Medical Superintendent, City Hospital, Edinburgh, and Lecturer on Infectious Diseases to the University of Edinburgh, Major, R.A.M.C., T.F. Second Edition. Illustrated. London: Henry Frowde (Oxford University Press), and Hodder & Stoughton, 1920. Pp. xii-627.

THE OXFORD MEDICINE. By Various Authors. Edited by HENRY A. CHRISTIAN, A.M., M.D., Hersey Professor of the Theory and Practice of Physic, Harvard University, Physician in Chief to the Peter Bent Brigham Hospital, Boston, Mass., and SIR JAMES MACKENZIE, M.D., F.R.C.P., LL.D., F.R.S., Consulting Physician to the London Hospital, and Director of the Clinical Institute, St. Andrews, Scotland. In Five Volumes. Illustrated. New York and London: Oxford University Press. Pp. xxiii-923.

MASSAGE AND EXERCISES COMBINED. A Permanent Physical Culture Course for Men, Women, and Children. Health Giving, Vitalizing, Prophylactic, Beautifying. A New System of the Characteristic Essentials of Gymnastic and Indian Yogis Concentration Exercises Combined with Scientific Massage Movements. With eighty-six Illustrations and Deep Breathing Exercises. By ALBRECHT JENSEN, Formerly in Charge of Medical Massage Clinics at Polyclinic Hospital and Other Hospitals, New York. New York: Published by the Author, 1920. Pp. 13-93.

PLASTIC SURGERY OF THE FACE. Based on selected cases of War Injuries of the Face Including Burns. With Original Illustrations. By H. D. GILLIES, C.B.E., F.R.C.S., Major, R. A. M. C., Surgical Specialist to the Queen's Hospital, Sidcup Surgeon in Charge of the Department for Plastic Surgery, and Late Surgeon in Charge of the Ear, Nose and Throat Department, Prince of Wales Hospital, Tottenham, etc. With Chapter on The Prosthetic Problems of Plastic Surgery, by Captain W. KELSEY FRY, M.C., R.A.M.C., Senior Dental Surgeon, Queen's Hospital, etc. Remarks on Anesthesia, by Captain R. WADE, R.A.M.C., Late Senior Anesthetist, Queen's Hospital, etc. London: Henry Frowde, (Oxford University Press) and Hodder and Stoughton, 1920. Pp. xiii-408.

Practical Therapeutics and Preventive Medicine

A Compendium of Treatment and Prophylaxis, Original and Adapted

Secondary Syphilis of the Heart.—C. Oddo and C. Mattei (*Bulletin de l'Académie de médecine*, March 30, 1920) believe the heart to be much more frequently involved in the secondary stage of syphilis than is generally thought. They report a case of syphilitic pericarditis and rapid heart failure in a patient aged fifty-four years with mucous patches of the labial commissures and scrotum. The heart improved slightly under mercury cyanide and novarsenobenzol injections—though refractory to digitalis—but on the day of the last injection pulmonary edema developed and death followed. The autopsy showed marked pericardial disease but no involvement of the myocardium nor endocardium. Cases already recorded show that mild secondary syphilitic involvement of the heart may be manifested merely in arrhythmia, and more severe involvement, in more or less pronounced heart weakness or failure. The diagnosis is based on the history and clinical course of the case, the Wassermann reaction, and especially, the therapeutic test. Cardiac disturbance should be carefully watched for in secondary syphilis, and syphilis should be thought of in all cases of rapid heart enfeeblement without known cause. The prognosis should be as guarded as that of definite syphilitic meningitis in the secondary stage. Antisyphilitic treatment, after preparatory measures similar to those preceding digitalis administration, is of greater service than the usual heart tonics. Mercury seems to be the remedy of choice. Arsphenamine should be used with caution as it may favor dangerous heart collapse and pulmonary edema.

Influence of Insufficient Treatment upon the Appearance of Meningeal Syphilis.—Marcel Pinaré (*Paris médical*, March 6, 1920) asserts that either insufficient or active antisyphilitic treatment may favor syphilitic involvement of the nervous system. In such cases an active drug has been given in insufficient doses, in unduly brief courses, or with undue intervals between successive courses. The treatment has been active enough to prevent the appearance of skin lesions, but the spirochetes have migrated to the nervous system, where they are less vulnerable. This accounts for the numerous nervous disturbances, deafness, ocular paralyses, etc., noted during the earlier trials of arsphenamine, especially during the period in which, owing to fear of untoward happenings, the doses were reduced. Nicolau, among fifty-one patients with chancres, found a spinal lymphocytosis in eighteen. When these cases were given twenty injections of 0.02 gram of mercury biniodide, the lymphocytosis, instead of diminishing, nearly always increased. The author observed similar effects in the treatment of nervous syphilis with arsenicals. Often there is aggravation of the clinical manifestations and increase of spinal lymphocytosis after the first series of arsphenamine injections. One of the cases mentioned showed that even an intensive treatment might be insufficient, in spite of the administration

of 5.25 grams of neoarsphenamine; the difficulty in this case was that the maximum doses of 0.9 or 1.05 grams were not reached and that the first series of injections was not followed up by further series. Therapeutic neurotropism may occur alike after mercurial or arsenical treatment. The essential point is that the compounds that are only moderately active, such as the benzoate or biniodide of mercury and mercurial pills are dangerous; likewise, small doses of highly active preparations are dangerous, and single series of treatments or treatments at excessive intervals with the highly active preparations are dangerous. At the onset of syphilis the treatment given should be intensive and the drugs used administered in actually spirocheticide doses. After the initial treatment, the period of rest should be short. Treatment should be kept up to the point of disappearance of the clinical, serological, and cerebrospinal signs. The least nervous reaction indicates intensive treatment. Intense and continuous treatment of syphilis during the first few weeks of the infection affords some chances of complete cure. On the other hand, faulty management at the outset may, as in one of the cases reported, result in the development of lesions removable only with difficulty, even by prolonged treatment.

A Comparative Study of the Trypanocidal Activity of Arsphenamine and Neoarsphenamine.—Jay F. Schamberg, John A. Kolmer, and George W. Raiziss (*American Journal of the Medical Sciences*, July, 1920), say that trypanocidal tests employing rats infected with *Trypanosoma equiperdum* provide a means for determining the curative properties of arsphenamine and neoarsphenamine. Medicinals which prove trypanocidal *in vivo* are probably curative in syphilis; other compounds, such as the mercurials, which are unable to influence experimental trypanosomiasis, may still influence infections with *Trypanosoma pallida*; such tests possess, therefore, a greater positive than negative value in chemotherapeutic studies in syphilis. In conducting such tests the virulence of the strain, the method of infection, the interval between infection and treatment, and the weight of the test animals are modifying factors and must be rendered uniform to secure satisfactory results. With the strain of *Trypanosoma equiperdum* employed in the experiments described, the smallest amounts of arsphenamine sterilizing rats infected twenty-four hours previously varied from 0.010 to 0.030 gram to the kilo of body weight, the average being 0.023 gram to the kilo of rat. The smallest sterilizing doses of neoarsphenamine under identical conditions varies from 0.020 to more than 0.040 gram to the kilo of rat; average about 0.040 gram to the kilo. The trypanocidal activity of different lots of arsphenamine and neoarsphenamine prepared by the same laboratory and by different laboratories varied in a manner analogous to variations in lethal toxicity for rats. The trypanocidal activity of arsphenamine is 1.74 times greater than that of

nearsphenamine, and 0.6 gram arsphenamine equals 1.05 rather than 0.9 grams of nearsphenamine in therapeutic activity. The trypanocidal dose of arsphenamine is 4.56 times less the highest tolerated dose for the rat; that of nearsphenamine is 6.35 times less the highest tolerated dose. These results indicate that nearsphenamine is a somewhat safer compound than arsphenamine; even when one gram of the former is administered as equivalent in therapeutic activity to 0.6 gram arsphenamine, the margin of safety is greater.

Comparative Studies of the Toxicity of Arsphenamine and Nearsphenamine.—Jay F. Schamberg, John A. Kolmer, and George W. Raiziss (*American Journal of the Medical Sciences*, August, 1920) say that in so far as the toxicity of arsphenamine and nearsphenamine may be determined by intravenous injection of solutions in rats, the single dose of arsphenamine commonly administered (0.6 gram) may be said to be about one twelfth the highest tolerated dose, and the highest single dose of nearsphenamine commonly injected (0.9 gram) is about one nineteenth that of the tolerated dose. From the viewpoint of the margin of safety larger amounts of nearsphenamine may be given and maintain the same ratio between the therapeutic and the tolerated dose as apparently exists with arsphenamine.

Relapses After Prostatectomy.—Victor Blum (*Urologic and Cutaneous Review*, May, 1920) mentions the following possibilities in recurrence after prostatectomy: 1, Carcinomatous relapse, either as a local recurrence after extirpation of a carcinomatous prostate, or as a carcinomatous degeneration of the site of operation or of the scar after removal of an apparently benign tumor, but in reality one undergoing malignant change; 2, recurrence due to an incompletely performed prostatectomy, that is, in place of a total or subtotal prostatectomy, an incomplete operation; 3, recurrence in consequence of cyst formation in the *loge prostatique*—an observation made by Papin, cited by Nogues; 4, recurrence due to new formation of glandular tissues.

Treatment of Syphilis.—F. W. Cregor (*Journal of the Indiana State Medical Association*), in discussing the method of treating syphilis practised in United States Public Health Service Clinics of Indiana, emphasizes the following points: 1. The medical profession should take an uncompromising stand for the full and complete treatment of syphilis. 2. This can best be done by full cooperation with the lawfully constituted health organizations of the country. 3. Syphilis may be aborted if encountered before five weeks have elapsed from the contraction of the disease. 4. Syphilis may be cured by one year of treatment, providing it is encountered before it has found lodgment in the tissues of the host. 5. Syphilitics may be assured that they will remain free of symptoms, providing they fully cooperate in the treatment. 6. The Wassermann test should be employed as an aid and a comfort, and not as a guide and a control for action. 7. As full cooperation is impossible in the face of ignorance of the disease and its potentialities, it is necessary that the patient be apprised fully and honest-

ly of these things. 8. Steps should be taken to reclaim the neurosyphilitic, possibly through the insane institutions, until such time as public enlightenment will relieve the present demand. 9. A spinal Wassermann test should be made in all cases before the patient is discharged.

Hereditary Syphilis and Dystrophies.—P. Huttel (*Archives de médecine des enfants*, January, February, March, and April, 1920) divides the lesions dependent upon hereditary syphilis into two groups, those containing specific, localized alterations, such as treponema, and those involving nutritional difficulties producing dystrophies. Most of the stigmata of the disease are found among the dystrophies. Stigmata are usually multiple, such as deformities of the skull, the nose, the teeth, alteration of the cornea, the ear, the testicles, etc. There may also be visceral scleroses. These are the local dystrophies. The general dystrophies interfere with the development of all parts of the same apparatus. They are usually indicated by nutritional difficulties, often involving the nutritive agency of the endocrine glands. When the nutritional difficulties, imputable to glandular or organic lesions, have been caused by hereditary syphilis or by some other morbid processes, they may be transmitted from parents to children. Specific medication becomes less important as the dystrophies caused by hereditary syphilis draw away from their infectious origin. Qpotherapeutic medication is, however, increasingly indicated as the infection recedes.

Significance of Syphilis in Prenatal Care and in the Causation of Fetal Death.—J. Whitridge Williams (*Bulletin of the Johns Hopkins Hospital*, May, 1920) bases the present study on 302 fetal deaths occurring in 4,000 consecutive deliveries between April, 1916, and December, 1919. In each case a Wassermann test was made and if the result was positive the patient was given treatment provided sufficient time was available before delivery; 1,839 of the patients were white, and 2,161 were colored women. The Wassermann reaction was positive in 2.48 per cent. of the white patients and in 16.29 per cent. of the blacks. Autopsies were performed on 212 of the 302 dead babies. In these figures are included not only those dying at the time of labor or during the two weeks immediately following it, but also those dying during pregnancy from the time of viability onward. Ninety-nine of the 302 deaths occurred in white and 203 in black infants, while 157 occurred at the time of labor or during the first two weeks of the puerperium, and 145 were in premature children. Syphilis was noted in 104 cases, in 89 of which the diagnosis was confirmed at autopsy by the demonstration of spirochetes; in the rest it was made on the presence of syphilitic lesions in the placenta, associated with a positive Wassermann in the mother. Syphilis was responsible for 34.44 per cent. of the total number of deaths in this group of cases. In the patients where syphilis was recognized early in pregnancy and appropriate and efficient treatment was given, hopeful results were obtained, so that if women register prior to the middle of pregnancy in properly conducted clinics syphilis may be practically eradicated as the cause of fetal death.

Sodium Taurocholate in the Prophylaxis of Gonorrhoea.—L. Cheinisse (*Presse médicale*, February, 14, 1920) notes that Aldo Castellani has found that bile and bile salts prevent the development of the gonococcus *in vitro* and has recommended the local use of a solution of two to four grams of sodium taurocholate in thirty grams of pure glycerine as a gonorrhoea prophylactic. A few drops of this solution are dropped in the meatus, held open for the purpose, and over the glans and the balanopreputial sulcus, before coitus. Later the organ is washed and the prophylactic local medication repeated. Some of the solution may be instilled with a small syringe. In one clinical experiment, fresh gonorrhoeal pus containing many gonococci was mixed for three minutes with the sodium taurocholate solution and introduced into the healthy meatus. In another, a few drops of the remedy were introduced into the meatus, followed, three minutes later, by gonorrhoeal pus; after five minutes, the subject urinated, washed the organ with soap and water, and introduced a few more drops of the taurocholate solution. Neither of these subjects contracted gonorrhoea. The preparation is considered advantageous in being easily prepared, inexpensive, requiring no apparatus for its employment, and in causing no local burning or pain.

Removing Ureteral Calculi Without Operation.

—A. J. Crowell and Raymond Thompson (*Southern Medical Journal*, June, 1920) reported in August, 1918, the successful application of the method given below in twenty-nine out of thirty-one cases of urethral stone, and since then have been successful in twenty-five other cases. A bismuth catheter is inserted into the ureter until it meets with obstruction. An x ray picture is taken to demonstrate that the obstruction is stone, as well as to ascertain its size and location. No obstruction should be diagnosed as stone unless it is shown in the picture or is recovered, as the symptoms of stone may be simulated by ureteritis, ureteral stricture, kink, or pressure on the ureter. Two c. c. of a two per cent. solution of cocaine or procaine is slowly injected into the ureter at the site of impaction. The ureteral spasm is so relaxed in a few moments that the catheter will usually pass beyond the stone, where another c. c. or two of the anesthetic is injected further to deaden the sensation. At this point it is well to distend the kidney pelvis with a physiological salt solution and inject sterile olive oil as the catheter is being removed. In this way the pressure above the stone is increased and assists in expelling it, while the muscular fibres of the ureter are relaxed and the sensation is deadened. If we fail to get the eye of the catheter above the stone, sterile oil is injected against it with considerable force in an endeavor to dislodge it as well as to lubricate the parts and dilate the ureter below the obstruction. The patient is given morphine and instructed to drink water freely. This technic is repeated every second or third day, increasing the size of the ureteral catheter each treatment. Quite frequently a No. 11 stoppered catheter is inserted and left *in situ* for hours. This is especially beneficial where it is impossible to get past the stone and the obstruction to the secretion is incomplete.

Precocious Malignant Syphilis.—Queyrat and Mouquin (*Presse médicale*, January 31, 1920) report the case of a woman suffering from primary malignant syphilis, with fever and poor general condition. The Bordet-Wassermann reaction was partially positive. No spirochetes could be found, but under injections of novarsenobenzol the lesions underwent prompt retrogression, the temperature receded and the general condition improved. The writers make a distinction between severe syphilis and precocious malignant syphilis; in the former the spirochete is generally found, but in the latter it is wanting. The condition is a special morbid entity beginning with a chancre, often of ulcerative type. There was no mucous patches and no roseola. Lesions of different age are found on the patient at the same time, viz., papules, vesicopustules, and crusted and ulcerous lesions. The Wassermann remains negative at first, becoming positive two or three months after the start of the infection. The various mercurials and potassium iodide are generally insufficient to remove the manifestations of the disease. Arsenobenzol, on the other hand, is very efficacious. The etiology of this precociously malignant form of syphilis remains obscure. It does not seem possible to ascribe it to the general condition of the patient, for the disease occurs in robust individuals. Possibly a special strain of spirochete is responsible for it.

Diagnosis and Treatment of Luetic Involvement of the Optic Pathways.—Mark J. Schoenberg (*Archives of Ophthalmology*, March, 1920)

says that although our present means of establishing a diagnosis constitute a pretty good armamentarium to furnish more or less satisfactory information, early diagnosis of syphilis of the optic pathways is not made except in an infinitesimal percentage of cases. He asserts that examinations should be begun as soon as the primary lesion makes its appearance and repeated at regular intervals during the entire time the patient is under the observation of the physician. Diagnosis must be accurate, and one of the most difficult problems is the diagnosis of a nonsyphilitic condition in a patient with syphilis. There are many pitfalls, of which he considers the first and most dangerous to be the Wassermann blood test. It has almost become an established tradition that a patient with an optic neuritis or an optic atrophy, and a three or four plus Wassermann blood reaction, must have a syphilitic optic nerve lesion, yet nothing may be further from the truth. A single blood test can never be depended on for a final decision. The condition may be due to a cause other than syphilis, though the patient be syphilitic, or it may be due to syphilis plus one or several other causes. Conditions to be borne in mind while investigating such cases include, first, acute or chronic sepsis from foci of infection in nasal sinuses, tonsils, teeth, gallbladder, appendix, genitals, and intestines; second, acute or chronic toxemias, lead, arsenic, alcohol and disturbances of digestion, nutrition, elimination, and the endocrine system; third, acute or chronic trauma, emotional, physical, occupational, such as aneurysms, empyema of the nasal sinuses, periostitis of the optic foramen; and fourth, heredity and congenital conditions. One

of the most valuable additions to our diagnostic armamentarium of late years is the examination of the spinal fluid. The information we obtain shows us whether we have to deal with a luetic involvement of the central nervous system; gives a clue as to about what pathological type of lesion of the optic path we are dealing with, and furnishes us a good deal of information about the prognosis. Concerning the disagreement of opinion regarding the indications and efficacy of intraspinal and intracranial medication, he thinks that the good results obtained are due not so much to the medication as to the meningeal reaction, the active hyperemia.

After a diagnosis has been made we must ascertain whether there is yet present an active process. End results of a condition which has come to a standstill need no treatment. A partial optic atrophy with no tendency to progress, with negative findings in the blood and spinal fluid, and no clinical evidence of an active neurological disease, should be watched but not treated. For patients with vision reduced to counting fingers at a few feet, poor fields and atrophic discs, there is not much hope. There remains the group of cases with 20/200 vision or more, with fairly good fields, and in good general condition, to be treated according to the type of neurolyues and type of optic nerve lesion present. Therapeutically it is of the greatest importance to have a clear idea of whether we have to deal with taboparesis, cerebrospinal lues, or a vascular case; what type of optic pathway lesion the patient has, and in what stage of lues the optic pathway became involved. The indications, the dose, the frequency of treatments, and the method of administration are quite different, not only in each type of neurolyues, but also in each type of optic path syphilis. It is therapeutically meaningless to say optic atrophy, without mentioning the kind of atrophy we are dealing with.

Treatment of Varicose Ulcers, Chronic Metritis, and Chancroid with the Salts of Rare Earth Metals.—Albert Frouin (*Bulletin de l'Académie de médecine*, April 6, 1920) asserts that salts of the rare earth metals, and in particular the sulphates of the cerium group, which are less irritating than the nitrates and chlorides, possess antiseptic properties. Two to four per cent. solutions of these salts promote the healing of wounds, and favor the formation of the dermis and of the epithelial layers. In war practice good results were obtained in atonic wounds that had already been suppurating for prolonged periods. One patient had been in a hospital eighteen months with a large burn of the scalp in the occipital region. Suppuration was very marked and showed both the staphylococcus, streptococcus, and pyocyanus; grafting had already been tried without success. Later another graft was applied and covered with dressings of two per cent. lanthanum sulphate solution. Six weeks later the wound had almost completely closed. In four cases of long standing varicose ulcer, moist dressings of rare earth salts twice daily brought about healing in twenty to thirty-three days. In thirty-four patients with ulcers of the cervix or chronic metritis tam-

ons impregnated with solutions of rare earth salts were used twice weekly. In some instances an iodine compound was applied for a short time before introduction of the tampons. As a result, pain and dragging sensations were relieved, discharge ceased, and healing took place in four to twelve weeks or, in five patients in whom daily treatment could be given, in fifteen to twenty-two days. In a case of chancroid of the fourchette, insertion two or three times a day of a tampon impregnated with lanthanum sulphate solution, together with special treatments twice a week, was followed by recovery in seven days. Guénot, in a number of cases of chancroid in men, treated with two to four per cent. solutions of lanthanum sulphate, obtained recovery in from seven to twenty days.

Effects of Mercury Salicylate on the Wassermann Reaction.—Herman Goodman (*Archives of Dermatology and Syphilology*, August, 1920), presents his observations on the results of serological treatment in previously untreated syphilitic men. He states that eighty-seven of these men, with four plus Wassermann reactions, were given one grain of mercury salicylate intramuscularly at weekly intervals for courses of from six to eight injections. The Wassermann reaction, immediately after treatment, remained strongly positive in sixty-six per cent. of the cases. In only nine per cent. was there a reversal to negative; and in some of the patients, who were given a third Wassermann test after an interval without treatment, the reaction was positive. It seems fair to conclude, with Anderson and Nelson who carried on a similar study in 1915, that mercury salicylate alone and for the period given does not qualify as a curative agent in syphilis. The plans for a longer study were curtailed by the demobilization. In the future mercury salicylate will be used in increasing doses up to two and two and a half grains weekly.

Tests of Renal Function.—C. W. Dowden (*Southern Medical Journal*, May, 1920), in presenting a comparison of a few of the simpler tests with the more elaborate ones, states that in his opinion practically as many facts can be obtained by a careful examination of the urine at each voiding, regardless of time and covering a period of three days or longer, during which only capacity diet is insisted upon, especially in the quantity of the night urine and the fixation of specific gravity at a high or low level, as can be obtained by the more elaborate methods. Comparing the daily output with the intake offers not only valuable diagnostic evidence, but is a most helpful index for proper treatment. He has seen marked improvement in chronic nephritis by limiting the intake of fluids to not more than 400 c. c. in excess of the previous day's output. Blood pressure (except in the arteriosclerotic) usually declines promptly, and when there is close agreement in intake and output there is always noticeable a marked improvement in the patient's general condition. He is firmly convinced that the indiscriminate advice to nephritics to drink an abundance of water is wrong and probably as dangerous as to advise them to eat plenty of meat and salt. In chronic nephritis the salt output is disturbed little or not at all.

Proceedings of National and Local Societies

SOCIETY FOR THE PREVENTION OF VENEREAL DISEASE.

*First Annual General Meeting held in London, on
Thursday, June 3, 1920.*

LORD WILLOUGHBY DE BROKE, President of the Society, in
the Chair.

President's Address.—LORD WILLOUGHBY DE BROKE said that the origin of this society was a certain White Paper which was published by the Government some months ago setting forth the official view with regard to what was then called prophylaxis in relation to the treatment of venereal disease. That White Paper was issued as an account of the deliberations of an Interdepartmental Committee appointed for the purpose of inquiring into the subject. The whole purport of the report and the whole complexion of the official point of view was against the policy of immediate self-disinfection as a prophylaxis against venereal disease, which had undoubtedly been proved to have been a success. No disease had ever been stamped out merely by trying to heal the symptoms, unless the healing had been accompanied by the most scientific methods of prevention. The prevention of venereal disease was of two kinds: moral prevention, and second, abstinence from promiscuous intercourse. All that was very good and should be advocated on every possible occasion, but the common sense of the thing was that if you wished to avoid contagion you should avoid contact. It was equally true that in spite of all the exhortation and in spite of the fact that the nation—and in particular the army—had been lectured over and over again with regard to the dangers of promiscuous intercourse, venereal infection was still proceeding at an alarming rate; moral prevention, although an excellent thing so far as it went, had hitherto failed to achieve the object of stamping out or even of lessening the incidence of the disease.

There remained medical prevention of two kinds, delayed or immediate. The official policy was that of delayed disinfection which it was proposed to carry out at ablution centres where those who had been incontinent should be treated by a skilled attendant. If people were to know where they were, these ablution centres must be made conspicuous. But if they were made sufficiently conspicuous to attract attention they would be so conspicuous that no person would care to be seen entering an establishment of that kind. Nothing was more grotesque or more liable to incite the blackmailer and the spy than an ablution centre in a rural village. So much for delayed disinfection. Therefore, it remained to consider the other policy, which was the primary policy of this society, that was the policy of immediate self-disinfection applied by the man or the woman within a few seconds after coition had taken place. The Government thought this would make promiscuous intercourse between the sexes too easy and would deliberately invite people to indulge in it. That was a low estimate to

form of the morality of one's fellow countrymen, and if venereal disease was only kept in check by fear of the consequences, he was afraid fear had not been a very successful agent in stamping out promiscuous intercourse between the sexes. The only safe, the only wise, the only human, the only statesmanlike course was to recognize the fact that in spite of all this preaching and lecturing and incitement to lead a healthy life, we had at present failed to suppress the sexual instinct to such a degree as to have any effect upon the incidence of venereal disease. Therefore, if you were to attack venereal disease, you must attack it at the weakest link, and the weakest link in the chain of infection was immediately after the connection had taken place. Hence the whole aim and object of this society was to urge the Government to bring pressure on all public bodies to issue such instructions to our fellow countrymen and countrywomen as would enable them to take advantage of the latest teachings of science, in order that they might themselves use immediately after connection, if connection there must be, such ample disinfectants as were known to be efficacious in destroying immediately the spirochete and the gonococcus.

The highest moral attitude that the State could adopt was the health of the citizens, and we would not be responsible to future generations for our having suppressed knowledge which, if intelligently applied, might well prevent thousands of them from hideous sufferings in the future. Only one obstacle which stood in the way of the adoption of that policy and that obstacle was contained in a certain clause in the Venereal Disease Act of 1917, the gist of which was that no person should hold out or recommend to the public any notice or advertisement of anything for the prevention, cure or relief of any venereal disease. In order to test this the speaker went to a well known chemist in the West End of London and asked him whether he could supply some calomel cream ointment, thirty-three per cent., and a solution of one in a thousand of potassium permanganate, and he said yes. If he had come into the shop and asked for these things with a view to averting venereal disease the chemist said he could not legally supply them. Inasmuch as a little unscientific knowledge was dangerous in the highest degree, it was important that knowledge should be made available to the public under the control and with the supervision of qualified medical authorities, such as the Ministry of Health, medical officers of health all over the country, or the local government board. It was to that policy that he invited cooperation, he therefore asked votes for this resolution:

Resolved, That inasmuch as the Ministry of Health had failed, and public bodies, including the London County Council, have declined to provide the means of delayed disinfection against venereal disease at ablution centres, this meeting calls upon the Ministry of Health and upon local authorities to instruct all qualified chemists to sell such means of immediate self-disinfection against venereal disease as may be approved from time to time by the Ministry of Health or by medical officers of health.

DR. C. W. SALEEBY, F. R. S. E., said that it was astonishing that those who were now opposed to us had themselves connived at the confusion between prevention and treatment which we desired put an end to. When attempts were made in the army to deal with the disease by means of disinfection, those attempts were labeled early treatment, and by those who labeled disinfection early treatment we are now told that a policy of disinfection would lead to the belief that disinfectants could be used for treatment. That was not our fault; it was the fault of those who did not have the common honesty to label disinfectants as such, but called them early treatment, which they were not, and could not be. The resolution which Lord Willoughby de Broke had proposed drew attention to the fact that at this moment there was no effective work being done against the spread of venereal disease in this country. The great obstacle in the way of making progress was the Ministry which had been largely created for the purpose of dealing with venereal disease. He drew attention to the fact that there had just been published the report of the National Birthrate Commission, a body which devoted a great deal of attention to this subject. In the last two years they heard evidence from Sir William Osler, Sir Bryan Donkin, and Mr. E. B. Turner, a body which comprised a number of women, a minority of whom were scientific, and which was presided over by the Bishop of Birmingham. The National Birthrate Commission recognized that no difficulty of an official kind should be placed in the way of obtaining disinfectants by individuals for use after exposure.

Sir JAMES CRICHTON-BROWNE, F. R. S., said the society had every reason to be grateful to the people of the country for the support and the encouragement it had received, but it had a great task, and if it was to perform that task properly it must appeal for help and support, and he would particularly bring this home to the employers of labor. In the *Times* this morning there was a letter from Mr. Hyndman pointing out that the rats were at this moment consuming grain to the value of £45,000,000 annually. There was another kind of vermin, a much smaller kind, the spirochete, which was responsible for syphilis that was costing the country hundreds of millions per annum, and it would be a great economy on the part of the government if it would place in our hands £100,000 at this moment to carry out a complete and efficient propaganda throughout the whole country. It would result immediately in the saving of millions. They should remember that 20,000 infants were destroyed by syphilis before birth; all through childhood it was carrying off promising children; it was rendering fruitful women barren, and if we could only obtain an accurate account of its effect on labor, and the number of day's labor that were lost by men suffering from syphilis and whose productivity afterward was reduced by poor health, we should have a most startling return. That was what this disease was costing the country.

He would urge the employers of labor to come to us, to invite us to provide lectures for their working men so that there could be further propaganda.

SIR FREDERICK MOTT, K. B. E., M. D., F. R. S., said it was true that the disabilities produced by syphilis were colossal, and from an economic point of view it would be of the greatest value to the government to do everything they could to support this propaganda both from a health point of view and from an economic point of view.

Mr. H. WANSEY BAYLY, M. C., said the progress during the seven months of the society's existence had been most encouraging. When he first conceived the idea of forming this society he gathered that the majority of the medical opinion would favor such a scheme, and after consultation with Lord Willoughby de Broke and Dr. Saleeby the first small meeting of the Venereal Prevention Committee took place on September 22nd; a month later this committee formed itself into the Society for the Prevention of Venereal Disease and a provisional constitution was accepted. On December 10th our president raised the question in the House of Lords of immediate selfdisinfection as a preventive of venereal disease and asked for papers relative to incidence of venereal disease in Portsmouth Military Area. The Ministry of Health replied in a White Paper in February in which inaccuracy in former statements was admitted. Our membership now ran into hundreds and our grand committee, which was limited to 100, was full. During the first seven months of the society's existence we held two public meetings in London. The editorials of *The Lancet*, *Public Health*, *Medical Press*, *Medical Officer*, *Medical Times* and *National Health*, made it evident that these journals recognized the supreme importance of immediate self-disinfection as a method of preventing venereal disease.

American medical papers were mostly sympathetic.

The NEW YORK MEDICAL JOURNAL, in reviewing his book on venereal disease, which expressed the views of the society, stated: "The chapter on prophylaxis is extremely sane and wholesome and in marked contrast with the sentimental exhortation of elderly men influenced by their moral views." The nonmedical press was still rather shy, with the exception of the *Times*, which had published three leading articles in support of our movement and four letters from the Executive Committee. Branches of trade unions were showing a keen desire to hear lectures on the subject of the prevention of venereal disease, and he was now giving two or three lectures a week to most appreciative and intelligent audiences.

To stamp out venereal disease was a noble goal, and if this goal were achieved it would be cheaply bought at the expenditure of all our lives and all our money. In this small society centred the principle that it was immoral to withhold a scientific truth from the people, the knowledge of which would diminish disease, pain and sorrow. We were but an obscure few, a voice in the darkness, but it was possible that we might achieve a niche in history as a society which dared range itself in opposition to clericalism and the government and which added to the sum of human happiness in spite of this opposition by appealing directly to the innate sanity of the people.

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Original Communications

THE DIAGNOSIS OF INFLAMMATIONS OF THE MALE URETHRA.

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At first glance it may seem almost superfluous to discuss the diagnosis of urethritis, the subject is apparently so simple and elementary. In fact, however, the subject is neither simple nor elementary, to which statement any patient who has been a victim of an erroneous diagnosis readily can testify from his bitter experience.

It is essential to remember primarily that urethral infections vary considerably as to their etiology and the clinical manifestations will reflect in great measure these variations in the causative factors. We recognize two kinds of urethritis: specific urethritis, in which the gonococcus is the predominating etiological factor, and nonspecific urethritis, which includes all the other kinds of urethral infections.

When a patient presents himself with a urethral discharge and other symptoms indicating an inflammation of the urethral canal, we are brought face to face with the task of determining the nature of the infection in order that appropriate treatment may be instituted; and the first step that must be taken is to determine whether we are dealing with a specific or a nonspecific infection, and if the latter, what is the underlying factor in the case.

Unfortunately, it is probably within the truth to say that this is not the usual procedure. The task of determining the precise nature of the urethral infection is not an easy one, and the busy practitioner does not readily find the time that must be devoted to it if it is to be attempted conscientiously. Usually the presence of a discharge, purulent urine, and urinary discomfort are considered sufficient to make the diagnosis of gonococcal infection, but the experienced practitioner sooner or later learns to his regret and mortification that this procedure is not always fair either to his patient or to his own reputation.

Let us first consider the nonspecific urethritides. Luys (1), referring to the organisms which have been found in nonspecific urethral discharges, mentions a formidable array, the following being among the most important: streptococcus, bacillus coli, pneumococcus, staphylococcus, various Sarcinae, diphtheria bacillus, tubercle bacillus, Micrococcus

fallax, and Micrococcus cereus albus. In addition, we may include perhaps the most important and the most frequently encountered—the Micrococcus catarrhalis. Then there are the so-called aseptic inflammations, in which neither the gonococcus nor other organisms can be found. The microscope shows nothing but pus cells, a few epithelial cells, and occasionally strings of mucus.

It is of supreme importance to know whether we are dealing with an undoubted gonococcus infection or one of the nonspecific types—not alone because our treatment must depend on this differentiation but because extremely vital social and economic questions may be involved. Still more important is the fact that these nonspecific inflammations do not respond kindly to the measures which are often inflicted on the patients in the belief that the gonococcus is the offending organism.

The expert urologist, accustomed to seeing patients who have refused to get well under the persistent administration of silver salts and astringents, will frequently score a decided hit if he will recognize the nonspecific character of the disease and adjust his therapeutic measures in accord with these findings.

THE TYPE OF INFECTION.

It is therefore evident that if our therapy is to succeed we first of all must know what sort of infection we are dealing with. Familiarity with the use of the microscope is a *sine qua non*, but that is not enough. One should be able to correlate the microscopic findings with a thorough knowledge of the clinical symptoms presented by the patient. In a great measure this knowledge can be obtained only through extensive clinical experience. This is true of all knowledge, but with this knowledge must come wisdom—the ability to differentiate the clinical manifestations of specific and nonspecific infections.

This is particularly true in the urethral inflammations produced by the Micrococcus catarrhalis. For all practical purposes there seems to be no difference between the symptoms of acute catarrhal inflammation and the typical gonococcus infection, yet there is a decided difference if one has acquired the ability to observe and detect it. The symptoms generally are less severe; the discharge is less profuse, it is likely to be more watery or mucoid in its character from its incipency; the urinary discomfort may be slight or absent; the

meatus is but slightly or not at all inflamed. As the case proceeds, we are impressed with this unusual mildness throughout its course, and if the urethral mucosa is not irritated by strong local applications recovery almost certainly follows without complications or other distressing symptoms. Associated with these phenomena there may exist a general condition of diminished vitality, evidences of a catarrhal diathesis in other parts of the body, and evidences or history of alcoholism or sexual excesses.

THE MICROCOCCUS CATARRHALIS

In dealing with the *Micrococcus catarrhalis* we are confronted by the extreme difficulty of distinguishing it from the gonococcus, since it bears so close a resemblance to the gonococcus in almost all respects that it can be differentiated only by culture. This organism grows profusely on agar, and in this respect it differs materially from the gonococcus and the meningococcus which it closely resembles in other characteristics. It does not necessarily follow, however, that a urethral inflammation is to be considered as an acute catarrhal condition because it happens to be mild in character. Every urethral discharge must be regarded with suspicion and considered potentially gonorrhoeal unless it is proved otherwise; but it is the part of wisdom to keep one's eyes alert to all the possibilities and to use every means at one's disposal whereby doubt and suspicion may be replaced by certainty and conviction. Whatever treatment is instituted should be administered with caution and the developments should be watched closely. If it is found that medication is increasing the inflammation instead of diminishing it, we must recognize that nature is presenting us with substantial evidence (if we could but understand her warnings) that our treatment is unsuitable to this particular case of specific infection or that the infection is not gonococcal at all. In either event it is well to have a culture made and determine definitely whether we are dealing with the gonococcus, the *Micrococcus catarrhalis*, or some other organism.

On the other hand, occasions may and often do arise which require an immediate answer to the question whether or not a certain urethral inflammation is actually gonococcal in character, without waiting for clinical corroboration. In such cases if the microscope cannot decide the question, we are of necessity reduced to the single expedient of making a culture of the urethral discharge, and abiding by its results.

THE COLON BACILLUS

The colon bacillus is not an infrequent factor in the production of urethral inflammation, especially in persons suffering from rectal and intestinal disturbances. Clinically the cases resemble the catarrhal infections. The microscope shows an utter absence of diplococci but a culture reveals the colon bacillus. In a case which I saw recently through the courtesy of Dr. Herman Roth of this city, the inflammation began as a distinctly Neisserian infection—typical both clinically and microscopically. Several months after all evidences of the inflammation had disappeared under appropriate treatment,

in the patient, while traveling, there suddenly developed a severe acute prostatitis followed by a urethral discharge which contained no organism but *Bacillus coli*. Under treatment, the prostatic inflammation diminished perceptibly and was succeeded shortly after by an orchiepididymitis with suppuration. At operation, the entire epididymitis was found to be involved and the testis proper presented a number of suppurating foci. Numerous microscopic examinations and cultures of the discharge and the urine have been made repeatedly, and nothing has ever been found but the *Bacillus coli*.

OTHER NONSPECIFIC TYPES

The remaining nonspecific types of urethritis are so rarely encountered that they need only be referred to, with the warning that they should be kept in mind in every case which departs in any appreciable degree from the classical specific urethritis. Principal among these are the pyogenic or purulent urethritis following the introduction of unclean catheters or sounds into the urethra. Instead of the gonococcus, pyogenic bacteria are found in the discharge. Not infrequently there may be an appreciable elevation of temperature, due to toxic absorption. The same conditions sometimes develop as the result of *coitus in oram*; in these cases, the normal flora of the mouth may be recovered in the urethral discharge.

The urethritis which accompanies the development of a syphilitic chancre at or within the urethral meatus is less frequent. This type is most deceiving, even to the conscientious and skillful observer, for the meatus looks red and swollen, the discharge is rather profuse, and the urine is purulent. Gonococci are absent. One's attention is attracted, however, to the character of the meatus. The lips are rather whitish and shiny; they stand apart instead of approximating, and when felt between the fingers the typical induration of the initial lesion can be perceived. It goes without saying that the intra-urethral chancre cannot be felt at the meatus, but it is not rare for the keen observer to locate a chancre in the urethra by the sense of touch. The induration at the site of the lesion is distinct and unmistakable.

Chancroidal infection of the urethral meatus resembles the type just mentioned except that there is the chancroidal wormeaten ulceration, without induration, at the site of the infection. A painful inguinal bubo tending to suppuration is a frequent early accompaniment, and immediately should attract particular attention to the unusual character of the urethritis.

If the lesion is phagedenic in character, destruction of the meatal lips and urethral walls proceeds ruthlessly and without abatement until the process is halted. Treatment seems to be of no avail. In a case under my care some years ago, fully an inch of the urethra was destroyed in this way in spite of (possibly because of) the most conscientious and vigorous efforts. The destruction ceased only after the patient had been saturated with mercury and iodide—a combination which has been found very useful in these cases. For several weeks this man had been treated for gonorrhoea by his attending physician before the chancroidal lesion was noted.

THE GONOCOCCAL TYPE.

Having considered the most important nonspecific types of urethritis, the acute specific gonococcal type presents itself for our attention. With the unusual types in mind, the diagnosis of acute gonorrheal urethritis is a fairly simple matter. I was taught many years ago by a former preceptor, Dr. M. W. Ware, to look for the typical acute gonococcal triad, angry meatus, profuse discharge and purulent urine. Experience has borne out the correctness of this teaching. When corroborated by the microscopic finding of the gonococcus, whether the gram stain or the simple methylene blue, or the Unna-Pappenheim differential stain, there can be very little possibility of error in the diagnosis. It is well to repeat this acute specific triad: angry meatus, profuse discharge, and purulent urine. If one or more of these symptoms is wanting, the case should be regarded with suspicion until all doubts have been removed, but the absolute diagnosis never should be made without the positive bacterial finding.

Frequently a recurrent chronic urethritis will present the discharge and the purulent urine; in such cases the angry meatus will be lacking, and the gonococcus may not be found in the secretion. It is rarely that a chronic urethritis will present the red, angry, and swollen meatus that characterizes the acute infection. When it is present, one may safely act on the theory that an acute process has been superimposed on a chronic infection, either from without or from within.

It is well to remember an important diagnostic feature in this connection. If the practitioner will take the trouble to examine a large number of urethral discharges microscopically and study them carefully, he will observe that leucocytes predominate in the acute infection with few or no epithelial cells; whereas in chronic infections epithelial cells appear in much greater number and the leucocytes are diminished in quantity. A knowledge of this fact will often assist materially in determining whether the infection is a new one or merely an acute exacerbation of an old inflammation.

In the diagnosis of urethritis this fact is important to know and remember, in so far as it helps to determine whether we are dealing with a new infection, or an exacerbation of an old one. It is of great importance to determine this distinction because the therapy of the two conditions is decidedly different.

The next step in order but not less important, is the determination of the extent of the inflammation, that is, whether it has been confined to the anterior urethra or has passed beyond the cut off muscle into the posterior urethra. Generally, when the patient voids urine into two cylinders, if the first is purulent and the second clear, it is safe to assume anterior involvement. Both glasses purulent, usually indicates anteroposterior involvement. To make certain, it is advisable to do the simple two glass irrigation test (Smith) from time to time during the course of the disease. This test, as well as others devised for the purpose of determining the source of the pus in the urine, has been fully described by me in previous publications (2).

Additional evidence of extension to the posterior

urethra is the development of urinary symptoms, frequency, dysuria, perineal discomfort, chordee, and a feeling of fullness in the rectum usually proportionate to the degree of swelling and inflammation of the prostate and seminal vesicles. The irrigation tests, however, will reveal the existence of posterior involvement long before the patient may present any symptoms pointing thereto.

When we approach the subject of chronic urethral infections, we are treading on treacherous and difficult ground. Here the problem is much more complicated and a correct solution can be arrived at only through most careful clinical observation and study.

CHRONIC URETHRITIS

The symptoms of chronic urethritis vary considerably. The most frequent symptom is a urethral discharge, usually designated as the morning drop; less frequently, there is an elusive discharge which haunts the patient at odd times; he cannot say what particular time of the day it is likely to appear. Both of these types may be most provokingly elusive in character. The patient may swear by all that he deems holy that he sees a definite drop every morning or every afternoon; he describes it as to quantity, consistency, and color; but when he is asked to come to the consulting room in the morning, retaining his urine all night, he is usually compelled to admit (much to his regret) that there is no discharge present and the urine is absolutely clear and sparkling. "But," he insists, "yesterday there was a discharge," and he is sure there will be a discharge "tomorrow." I have been unable to explain the elusiveness of this particular kind of morning drop except on the theory that it is produced only as the result of milking the urethra for a sufficiently long period to squeeze out all the accumulated urethral matter. It is a good policy, however, to minimize the importance of any discharge that has to be "milked" before the first morning urine is passed. The adoption of such a policy will do more to reassure and satisfy a worried neurasthenic patient than anything else known to me. One must be discreet, however, in the manner in which this favorite possession of the neurasthenic is eliminated from his accumulation of complaints.

In any given case involving a chronic urethral discharge, morning or otherwise, the first question to be decided is: Where does it originate? This cannot be determined by the urethroscope nor by the patient urinating in three, five, seven, or twenty glasses. A careful study and application of the tests above referred to must be made before any diagnosis or therapy can be determined upon. If, however, there is the slightest ground for suspicion that the pus in the urine is derived from the bladder or higher up in the urinary tract, the five glass catheter test (Wolbarst) will provide definite information that will eliminate any existing doubt (2).

Now, having determined the origin of the pus or shreds, the next step is to locate the lesion and determine its character. When the physician has solved these two problems correctly, his patient may consider himself a lucky man; he is half cured. Every case must be studied on its own merits.

The most frequent cause is stricture; less frequently, are folliculitis, prostatitis, vesiculitis, and all their respective variations. Occasionally a case will be encountered in which one cannot discover the existence of any of the conditions just mentioned; but a careful examination made with the posterior urethroscope will reveal a well defined inflammation of the verumontanum and the adjacent urethral roof, floor and walls. The moral to be learned from this observation is that no examination of a case of chronic urethritis is to be considered complete without a urethroscopic examination covering both portions of the urethra. If the physician is not in a position to make this examination understandingly, it is unfair for him to undertake the diagnosis and treatment of such a case. Stricture in the anterior urethra cannot be diagnosed by the passage of a sound, as is so frequently attempted. If the urinary meatus is a large one, the *bougies à boule* are satisfactory but time consuming and wearing on the patient's patience and good nature. The Otis urethrometer is a decidedly useful and practical instrument, and if it is in good working order may be considered reasonably exact in the information it conveys. Unfortunately, it cannot be employed in the posterior urethra, in which the steel sound and the urethroscope must be brought into requisition. If the urethrometer, dilated up to 29-30 F., passes through the anterior urethra without impinging on an obstruction, there is no appreciable stricture of any account in that canal. It is wise, however, to increase the dilatation as high as 33-35 F., because distinctly appreciable obstructions are sometimes encountered at that figure. These may consist of fine bands of tissue or swollen follicles projecting slightly into the lumen of the urethra. These fine projections may and often do produce the continuing discharge. The urethroscope must be brought into requisition for the exact determination of their number and character, and the treatment required to relieve the patient of them. The diagnosis of chronic urethral folliculitis is made by the urethroscope unless the infected follicles are situated so far forward as to be visible to the naked eye.

Prostatitis is found in practically every case of chronic urethritis, possibly because nearly every prostate examined is more or less congested, and it is not an easy matter to draw a sharp line between the normal congestion and the pathological inflammation. A prostate that is larger than the average normal organ, tender on pressure, and exuding abnormal material after massage, must be considered pathological. Considerable enlightenment as to the diagnosis is afforded by a study of the urine voided after a fairly vigorous massage of the prostate. It is well to have the patient retain his urine as long as possible, from six to ten hours preferably. He then voids half an ounce in one glass. This urine may be absolutely clear, or it may contain a small number of fine shreds. The prostate is massaged while the patient holds a clean glass slide under the urinary meatus. The massage is continued until some of the secretion has fallen upon the slide. The patient then voids all his urine, and this urine is studied carefully. If it is still clear or but slightly

hazy, the prostate may be considered normal; in a typical case of chronic prostatitis this urine voided after massage will be found purulent to a greater or less degree and may present large masses of broken down detritus which are nothing else than purulent casts of the prostatic follicles. The important thing to remember is that clear urine voided by the patient does not necessarily mean a normal genital tract. Prostatic inflammation first must be eliminated, and this can be done only by massage and study of the massaged secretion. It need not be emphasized that the massaged secretion should be examined microscopically at frequent intervals, with particular reference to the presence of gonococci and pyogenic bacteria. The disappearance of gonococci and the decrease and ultimate total absence of other organisms from this secretion is the most convincing evidence possible of the restoration of the prostate to the normal.

What has just been said in connection with prostatitis applies in all respects to the subject of chronic vesiculitis. In point of fact, these organs are so closely interwoven, both anatomically and pathologically, that it is well to consider them practically one. Some writers maintain that they can obtain the vesicular secretion without contamination with the secretion from the prostate; but the common experience of most clinicians is that such claims cannot be substantiated except in rare cases. The anatomical conformation and position of the vesicles is such that it is practically impossible for the index finger in the rectum to strip them of their retained secretion, as can be done with the prostate. There are exceptional cases, of course, in which they hang low and are very large, and thus can be manipulated, but these exceptions are rare indeed. However, if perchance the vesicular secretion can be obtained uncontaminated with that from the prostate, it is highly desirable to take advantage of the fortunate circumstance and the secretion thus obtained should be studied both macroscopically and microscopically.

A clear understanding of the points made in this discussion of the differential diagnosis of urethritis will often produce results that will be most astonishing and surprising to both the physician and his grateful patient.

SUMMARY.

1. A correct diagnosis in urethritis means half a cure.
2. In acute urethritis the etiological factors must be determined to a certainty before treatment can be begun. The principal factors to remember are the gonococcus, *Micrococcus catarrhalis*, and the *Bacillus coli*. Next in importance, the extent of the inflammation must be determined. Extension to deeper structures must be recognized immediately.
3. In chronic inflammation, stricture, folliculitis, prostatitis, vesiculitis, and colliculitis are predominating causative factors. The diagnosis must be arrived at through precise scientific measures, not through guesswork.

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792 LEXINGTON AVENUE.

COMPARATIVE ANATOMY OF THE
GENITOURINARY ORGANS OF THE
LOWER ANIMALS.*

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The character of this paper makes it necessary for me to review, in a superficial way, the embryology of the organs of generation, as in many of the lower vertebrates the adult condition is a counterpart of that found in some period of development of the human embryo. All of the genitourinary organs are intimately associated in their development. The essential kidney consists of a tube open at the distal end from which are given off diverticulæ terminating in blind sacs. Such a kidney is present in adult life in some of the lowest types of fishes and as a transitory condition in the human fetus.

In the human embryo the common duct running from end to end of the body on either side of the notochord is known as the Wolffian body. It is developed from the skin sensory layer and acts as the primitive kidney, to terminate in the cloaca. With the further development of the Wolffian body there is formed at the same time the so-called indifferent body to become the future ovary or testicle. Such a condition is of short duration, there being developed out of the posterior part of the Wolffian duct near its entrance into the cloaca a secondary duct, the primitive ureter; this gradually elongates giving off diverticulæ, as noted, which become the renal tubules and are disposed in reference to the blood vessels exactly as were the diverticulæ of the Wolffian body.

The urine excreted passes into the posterior part of the stalk of the allantois, which, dilating, is retained in the body as the primitive bladder, later to separate from the cloaca and that part of the allantois that comes away with the umbilical cord. Thus are the permanent kidneys developed and replace the primitive, formed out of the Wolffian body, the duct of which does not disappear but separates into two distinct tubes the outer one still known as the Wolffian the inner as the duct of Müller. For a while the Wolffian duct still carries urine secreted by its tubules, but as the function is taken up by the ureter and the true kidney it is gradually transformed. If the individual is to become a male the body changes into an epididymis and vas deferens and carries the spermatozoa formed in the former indifferent body which is now a testicle; the duct of Müller persisting as the sinus pocularis, the homologue of the vagina. If the individual is to become a female the indifferent body produces eggs and becomes an ovary, the Müllerian ducts fuse together from below upward and become the vagina, uterus and Fallopian tubes—the Wolffian ducts atrophy but persist as the parovarian, which in certain animals, such as the pig, is patulous and opens into the vagina.

Early in intrauterine life the conjoined Wolffian

and Müllerian ducts pass into the expanded stalk of the allantois, the latter emptying with the alimentary canal into the cloaca. As the fetus develops the rectum separates and if the fetus is a female the united Müllerian ducts have a distinct opening lying between the urethra and the rectum. The urethra, if the fetus is a female, passes beneath the clitoris or female penis—the two adjacent folds of skin become the labia minora, the external the labia majora, the ovaries remaining in the body cavity. If the fetus is to be a male the urethra passes through the penis, the underskin of which is formed by the coalescence in the midline of what in the female is the labia minora, the scrotum being formed by the fusion at the raphæ of the labia majora, the testicles descending through the inguinal canal to the scrotum pushing in front of them their peritoneal investment to form the tunica vaginalis testis.

Bearing these points in mind hermaphroditism is possible by a diverse development of the sexual units, i. e., the indifferent body, the Wolffian and Müllerian ducts, but is hardly possible in the higher animals, though it does obtain in some lower forms, as the mollusca, worms, and in many plants, the stamens and pistil of the flowers forming the male and female organs respectively. In all vertebrates the sexes are distinct and the individual is developed from an impregnated ovum of a similar specie.

Starting with the lowest type, the fishes, the primordial kidney (Wolffian body) is persistent and excretes the urine from the venous blood. I shall not dwell in detail on other anatomical peculiarities that separate the four great divisions of vertebrates—fish, reptiles, birds and mammals. Fish exist and breathe in water. Some retain the primitive vermiform shape and develop no limbs; in others the fins are simple, move on one joint and are only adapted for propulsion or guidance. The body surface is either smooth or covered by scales. The brain is small, consisting merely of a succession of ganglionic nerve masses connected with the organs of special sense. Touch is feebly developed. The tongue as an organ of taste is hardly apparent and functions chiefly in the act of swallowing or breathing. There is no external ear. The internal ear or labyrinth is present with largely developed semi-circular canals, the cochlea rarely has a separate chamber but is lodged in the cranial cavity with the brain. The eyes are large, not protected by eyelids and have no lacrymal apparatus. The alimentary tract is short and simple. The esophagus is hardly to be distinguished from the stomach. The heart consists of one auricle receiving the venous blood, and one ventricle, to propel the blood to the gills for aeration, by the minute bubbles of air suspended in the water, taken into the fishes' mouth; from the gills the blood is circulated through the entire body being largely aided by local muscular contraction. The blood rarely has a temperature above the surrounding water.

Many fish have a hydrostatic air bladder between the alimentary canal and the kidneys which may communicate by a duct with the gullet. In reptiles as this structure becomes more highly specialized with increased vascularity and pharyngeal relations,

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the form changes to the cellular structure of a lung. The limbs acquire the character of feet, first two mere many jointed filaments as in *Lepidosiren*, then two fingers with elbow and wrist joints, as in land animals (*amphiuma*), next three fingered as in *proteus*, or four fingered but reduced to a pectoral pair as in *Lepidosiren*. From these gill retaining forms up to and including the *crocodilia* all cold blooded vertebrates with lungs are called reptiles. The heart has two auricles, the ventricle is imperfectly divided, so the venous and arterial blood are more or less mixed. The lungs are baglike, either single or in a pair of unequal size, with cellulovascular walls and are contained in a common thoracoabdominal cavity.

In the bird there are certain modifications. The air bag becomes obliterated by the multiplication of the air cells, so forming a spongy lung. A four chambered heart prevents mixture of the arterial and venous blood, so furnishing pure arterial blood to the body; the temperature is maintained at from 90° to 105° F., irrespective of the surrounding conditions. The lungs are fixed and communicate by air cells extending into the abdomen or other parts of the body. They are oviparous, have feathers, and the fore limbs are modified as wings.

In mammals the lungs are suspended in the thoracic cavity, separated from the abdomen by the diaphragm. They are hairy, give birth to living young with exception of the monotremes. All suckle their young. Although for convenience we can divide all vertebrates into hot and cold blooded, based on the character of the cardiac and respiratory system, this but tends to mask their many affinities. For example, the hot blooded birds with their complex lungs and heart by their genetic and developmental characters and their anatomical structure are more closely allied to the Saurians than to the warm blooded mammals, while the modern *Batrachians* (*frogs*, etc.) differ from other cold blooded air breathers by their developmental and genetic characters and closely agree with the fishes. The extinct *Pterosauria*, a flying reptile, with wings and air sac, links the birds with this class of reptiles. Other extinct orders, as *Ganocephala* and *Labyrinthodontia* show the artificial nature of distinctions between fish and reptiles and the close transitions that connect all cold blooded vertebrates.

Vertebrates might be divided into oviparous, including fish, reptiles and birds, and viviparous, containing mammals; second, into anallantoic or branchiata or allantoic or abranchiata; into *Hæmatothermal*, having spongy lungs and a four chambered heart and hot blood and *Hæmatocryal*, having a simple heart, less perfect lungs and cold blood. The first two classifications will not hold, as some reptiles and fish are viviparous, and the lower types of mammals as the *platypus* and *echidna* lay eggs. In the group of *Marsupialia* the young are not nourished by placental attachment but early placed in a maternal marsupium or pouch and nourished by milk forced into their mouths by contraction of a muscle surrounding the efferent milk ducts. The third classification will not hold, for certainly warm blooded birds are more closely allied to reptiles than they are to placental warm blooded mammals. So all

divisions are artificial and not founded on fact either in their present form or the forms of their fossil ancestors.

Taking these orders up in sequence I shall try to explain some of the peculiarities of the renal organs and the organs of generation. In all vertebrates there is developed at an early period an excretory organ consisting of a tube extending from each side of the cloaca forward along the dorsal region close to the spine, where numerous small blind tubes enter at a right angle. The long tube is the excretory duct; the blind tube entering into the distal end of the duct is the *Wolfian body* or rudimentary kidney. This condition persists in the fishes and acts as a true kidney by excreting urine. In the bony fishes the kidneys are long and extend through the whole of the greater part of the dorsal region of the abdomen. The ureters may open directly by a short canal into the cloaca as in the lampreys or into a urinary bladder in the higher types, either as a conjoined tube or two distinct canals. In the sturgeon the ureters receive the *vas deferentia* or oviducts in their course toward the cloaca, where they unite as a short duct to form the common outlet for the urine as well as the generative products. In the sharks this single canal terminates in a common penis or clitoris at the back of the anus within the cloaca.

In reptiles the kidneys are always distinct, two in number and more compact in form, otherwise resembling the fishes. In the higher types the *malpighian bodies* are demonstrable. In snakes the kidneys take the elongated form of the reptile and are flattened, divided into numerous overlapping lobes to accommodate themselves to the flexuosities of the body in which they are located. In most species they are unsymmetrically situated. The kidneys in the *Lacertilia* are shorter and broader than in serpents—this condition is even more marked in the *chelonians* or turtles. In the crocodiles the ureters terminate in a low papilla in the urogenital compartment of the cloaca behind the genital orifices. The forepart of the cloaca is dilated and the rectum opens therein by a valvular protrusion. The adrenals may or may not be present in different species of reptiles. The kidneys in *Batrachians* resemble the higher types of fishes.

The organs of generation in fishes present a progressive gradation from an essential gland, whether ovary or testicle being determined only by a microscopic examination of its contents, to a concentrated form of testicle, through to the development of a true vas, a seminal vesicle, and an intermittent organ with finally added claspers for holding the female during coitus. The female organs correspond closely to the male in their gradation. In all fish where the vas is absent in the male the oviducts are absent in the female. The male organs in *Batrachians* are the testes with their ducts and appendages, the seminal reservoir, a common excretory canal, and a terminal papillæ, but no true penis.

In the lizards and snakes the ducts from the kidneys and testes are distinct to the cloaca and terminate on separate papillæ, the testicles small and compact, abdominally placed and covered fully by peritoneum, frequently brightly colored.

They are much more complex and convoluted than in the Batrachian. The tunica albuginea is dense and firmly attached to the secreting portion of the gland. As is to be expected the testicles of the snakes are more elongated than in the lizards. The vas deferens goes along the kidney in short undulations to the cloaca terminating in papillæ near the beginning of the seminal groove. The penis consists of two invertible sheaths with a highly vascular lining membrane, bifurcating at the blind end, to which are attached the muscles of inversion and retraction for keeping them hidden in the base of the tail. The mechanism of eversion and erection is by tumefaction of the vascular lining, plus contraction of the constrictor basis caudæ and sphincter cloacæ. The surface of the everted and erect organ in many species is covered with either large papillæ or even in some retroverted scales like horny processes. As corresponding depressions are found in the bifurcated vagina of the female, it is evidently a provision of nature to prevent slipping during intercourse.

Lizards, due to their short and outwardly extended legs, and snakes, in whom external legs are totally absent, are obliged to use absolute vertical progression, so it is necessary that for the testes to be abdominally placed and the intromittent organs capable of retraction and lodgement in the base of the tail, to prevent injury when not in use. In turtles the testicle is elongated, the vas is large and compacted by many convolutions. Each vas terminates with the ureter in common papillæ, the spermatic orifice being near the bladder. The penis is short and is indicated when not erect by the seminal groove. Only the glans and the pointed end of the fibrocartilaginous part above it project from the surface of the cloaca. This is enclosed in a reduplication of the cloacal membrane which acts as a pseudoprepuce. On erection this fold is obliterated by eversion. The penis in fresh water and land turtles is longer and larger than in marine species, on account, probably, of the more domeshaped carapace. The urethral groove extends along the mid-dorsum becoming more deeply situated as it approaches the glans. On erection the swelling of its borders converts the groove into a temporary canal; it then appears to end in an orifice. The penis is composed of two corpora cavernosa cohering in the middle line and attached to the ventral surface of the cloaca and two median tracts of highly vascular erectile tissue, forming the walls of the median groove. This is lined with a mucouslike membrane. They arise by an enlargement analogous to the bulb and are continued forward to the glans. On each side of the penis is a canal, the proximal end communicating with the peritoneal cavity, the distal end ending chiefly in a reticulate sinus. The penis has two retractors arising from the ischium and extending along the ventral surface to the glans. This muscle folds up the penis on retraction at the same time closing the rectal orifice and that of the allantoic bladder. Erection is followed by eversion of the cloaca effected by the cloacal sphincter. In the Crocodylia the testicles are longer, the penis is single with a dorsal groove and resembles the foregoing genera with the exception that the peritoneal

canals do not penetrate the cavernous structure but open outwardly on papillæ situated on each side of the base within the cloaca.

From the foregoing it can be seen that lizards are allied to snakes by their double extra cloacal penis; tortoises are allied to crocodiles by their single intracloacal organ. The structure of the organ confirms the two types. In the females of the Batrachia the cloaca presents the following outlets, in front, the opening of allantois bladder, next the rectum, then the outlets of the oviducts, and finally the ureters. In scaled reptiles there is a rudimentary clitoris or some trace of the intromittent organ of the other sex. In snakes the termination of the oviducts are in semilunar fissures within the cloaca.

The accessory parts of some of the female reptiles are remarkable. As the temporary skin pouches on the back of some of the frogs—i. e., pipa, in *Notatrema* and *Opisthodelphys* there is a single large sac with its entrance above the vent. When functionally active it covers the entire back; when not it shrinks so as to be hardly visible. In the pipe fish and sea horse the male develops a marsupium or pouch in which the eggs are placed, hatched, and the young carried until they are able to shift for themselves.

ACQUIRED SEXUAL CHARACTERS.

I shall mention only a few of the acquired sexual characters. The newts acquire a dorsal crest and a broader tail fin, with swelling of the cloacal labia in both sexes. The Japanese salamander develops a claw on each digit of the forelimbs, the male frog acquires a dark swelling of the thumb so as to better hold his slippery mate. A number of the fish have claspers near the anal orifice for the same reason. The larynx of the toads and frogs hypertrophy in the spring, all reptiles develop a brighter color, as do the birds in their nuptial plumage. The buttocks and genitalia of some of the doglike apes, especially the mandrill, are wonderfully and gorgeously colored. In lizards and snakes the anal scent glands and in the crocodiles the submaxillary glands are active and give out a strong musky odor. In the mammalian, hoofed animals, especially, the scent glands increase in size and activity during the rut.

In birds, the few peculiarities met with occur in the male sex. The organs exhibit the essential characters of the oviparous type. The testicles are situated high in the abdominal cavity and never descend into a scrotum. The penis is either double as in serpents, when it is extremely small, or it is single, but no matter to what extent it may be developed it is simply grooved along the dorsal surface for the passage of semen. As there is no true urethra, Cowper's glands and the prostate are absent. The testicles are two in number and vary greatly in size and color in different birds. They are white in the falcon and the dove, pale yellow in the horned owl and the gallinule, bright yellow in the magpie, ruff ibis and oyster catcher, black in the partridge, heron and some seagulls. They have a strong tunic and are suspended in a peritoneal fold. There is a marked periodical variation in size, due to the short period of sexual activity, but this limited period is compensated by the frequency and energy of the

sexual act. For example, in the sparrow in January they are the size of a pinhead, while in April at the height of the breeding season the glands are the size of a large marrowfat pea; the left is usually larger than the right. The only suggestion of an epididymis is the remnant of Wolffian body. This part is frequently a different color from the testicle proper. The vas passes down to the cloaca beside the ureter; it may be dilated at its lower end into a false seminal vesicle. It ends in birds with a double penis in small papillæ in the urogenital division of the ureter. The base of each papilla is surrounded by a plexus of veins and arteries which serve as an erectile organ during the orgasm, when the fossa is everted and brought in contact with the likewise congested everted fossa of the female. In many of the birds that copulate in water a long single penis is developed to permit of a more efficient coitus. I shall take the drake as my example. The penis is a highly vascular part of the lining membrane of the cloaca continued from the front part of that cavity; in the passive state it is coiled up like a screw by the elasticity of its associated ligament. The vascular membrane gives off many small pointed processes arranged in transverse rows on either side of the urethral groove; these incline backward near the point of the penis. The elastic ligament is surrounded by cavernous tissue and terminates in the blind end of the evertible sac. A groove commencing widely at the base follows the spiral turns of the sac to its termination. The spermatic ducts open upon papillæ at the base of the groove. Therefore, this form of penis has a muscle by which it can be everted, protruded and erected.

In the ostrich the penis is attached to the front wall of the cloaca, the body is bent in a recess out of which it can be drawn and returned by muscles. It consists of two firm fibrous bodies, the fissure between which is covered by the cavernous erectile tissue bounding the seminal groove. It has no evertible sac formation. There is a third elastic cord internal to the cavernous substance which produces the twisted form. The organs of most birds resemble the fishes and frogs, while those of ducks are like the hemipenis of serpents and lizards, and the ostrich that of the tortoise and crocodile. In the female bird in early life both ovaries are the same size, but only the left develops, the right remaining stationary or finally completely disappearing. In the embryo the basis of the ovary appears in the same relation to the primitive kidney as the testis in the male. The clitoris of the ostrich arises from the anterior margin of preputial cavity of the cloaca and is grooved like the penis of the male and has similar muscles. A smaller clitoris exists in those birds in which the male has a well developed penis. Most birds in adult age show external sexual characters. In the eagles and hawks the female is larger than the male. In the gallinæ and similar polygamous birds she is smaller. In most birds the males have the more brilliant plumage, while the hen has a more or less protective coloring. An exception is the phalarope, but in this instance the male does the incubating, the female on the completion of ovideposition deserting the nest. The

comb and wattles of the cock demonstrate sexual cutaneous appendages. In swifts, swallows, crows, doves, and a majority of the waders the sexes are alike.

MAMMALS.

In mammals the external manifestations of sex are extremely indefinite in the moles, shrews and rats, and often require careful dissection to be determined. The male monotrema has the heel spur, the female marsupial has the pouch and is of smaller size. The male narwhal has a tusk; the cachalot the large head. In seals the canines are usually larger. This holds good in most carnivora.

External genital characters are marked in most orders as well as in many grass eaters. The male has the larger horns, when these characteristics are present. The lion has the mane. The elephant has the large tusks. In quadrumana up to and including the gorilla the male is larger and has bigger canines. In the orang and chimpanzee, as well as in man, the male exceeds the female in size and has a more abundant hairy covering.

The testicles in mammals are more complex and compact, the peritoneum adds a serous layer to the proper sclerous covering of the glands. In the majority they are extraabdominal all or part of the time and are contained in a skin pouch or scrotum. The epididymis varies in size and position in many species. In all the semen is conducted in coitus by a penis traversed by a canal or urethra which may bifurcate in the lowest orders. Additional secretions are added by the vesicular, prostatic and Cowperian glands, when these exist.

In monotremata each testicle is situated below the kidney, to which it is suspended by a fold of peritoneum. The vas arises from the upper pole of the testicle and is so transversely folded as to appear to prolong the epididymis to the neck of the bladder. The duct dilates at its distal end and terminates in a papilla in the beginning of the urogenital canal. Its proximal urethral opening is not in contact with the vas in the quiescent state. It is divided by a median septum into two lateral parts enclosed in a dense fibrous sheath. The whole penis, when collapsed and retracted, is concealed in a large preputial fold. The terminal half forms the glans, which in the ornithorhynchus has a quadrilateral form, the upper and lower surface of which is traversed by a marked groove. The exterior surface is covered with numerous hard epidermal spines. Its extremity is bifurcated, each lobe terminating in three or four large but softer spines. A levator muscle runs along the upper surface of the penis. This muscle arises by two lateral slips from the protrusive sphincter. The retractor penis arises from the base of the coccyx and is inserted into the origin of the penis near the beginning of the urogenital canal. The urethra begins by a small orifice at its root communicating with the termination of the urogenital passage. So with the action of the retractor penis and the sphincter cloaca it can be brought in contact with the terminal papillæ of the sperm ducts. Such temporary continuation of the urethra and seminal passages takes place only during the vigorous muscular and vascular engorgement of the parts during coitus, the semen being

expelled from one to the other without escaping into the cloaca. Under ordinary circumstances the urine is transmitted along the urogenital passages, escaping into the cloacal vestibule, there blending with the feces, as in birds. The seminal urethra continues single to the middle of the glans where it divides into two canals. Each branch runs along the middle of the bifurcation of the glans to the base of the terminal papillæ, where it subdivides into smaller channels opening on their apices. If you would slit the canal along its under surface, thus converting it into a groove, the male organ would be like that of the tortoise; and although the mammalian type of penis is manifest by a complete urethra, it resembles the lizards by the bifurcation of the glans. That the penis is essentially a sexual and not a renal organ is demonstrated by this complete separation of the urorethral from the semi-nourethral passage in the monotremata. Cowper's glands are of large size and their physiological relation to a true urethra is demonstrated by their presence in these egg laying mammals, while they are absent in egg layers with merely a seminal groove. The prostate and vesicular glands are absent. The function of the spur is unknown, but it may be used as a clasper during the sexual act.

In the marsupials the testicles are contained in a pedunculated scrotum in advance of the preputial orifice, the epididymis is large and loosely attached to the testicle. The vas passes along the muscle sheath formed by the cremaster as far as the abdominal ring, there binding down and back to terminate at the commencement of the urethra. There are no vesicular glands. As a homotype of the female vagina the prostatic urethra is longer and wider in the marsupials than any other mammals. There are three pairs of Cowper's glands. The penis consists of a cavernous and spongy portion. The separate origin of each lateral half of the spongy body constitutes a double bulb with a corresponding double accelerator-urinæ muscle for compressing its particular bulb. The two processes soon unite to surround the urethra but again divide to form a double glans in the multiparous marsupials, in which most of the ova are impregnated in both ovaries, i. e., phalangers, opossums, etc. In the uniparous marsupials, as the kangaroo, the penis is single.

Between the two extremes are the dasyure, koala and wombat. In the koala the glans terminates in two lobes, the urethra being continued as a bifurcated groove along the mesial surface; in the wombat the urethra terminates in similar grooves but the glans is larger and partially divided into four lobes. In the phalangers the glans is bifurcated and the papillæ horny. In *Perameles lagotis* each bifurcated division is perforated by the urethra, while in the phalangers and opossums a simpler groove is present. The retractor penis arises in the kangaroos from the middle of the sacrum, divides into two muscles behind the rectum to be inserted with its fellow at the base of the glans. In the marsupials, like the opossum which, having a bifid glans, enjoy a double coitus, there is a levator penis. This muscle is absent in the uniparous kangaroo. Another powerful muscle of erection is the sphinc-

ter cloaca which surrounds the base of the organ and by contraction compresses the venous blood supply. In all marsupials the penis when not in use is bent upon itself, retracted and hidden just within the cloacal orifice, from which it emerges as in egg laying vertebrates when erect.

In rodentia, such as squirrels, beavers, rats and mice, the passive penis is retracted and bent, with the glans directed backward within a prepuce which opens into and forms part of a common passage in which the rectum terminates. The testicles undergo a periodical increase in size with change of position, passing from the abdomen into a scrotum and being again retracted after the rut. Cowper's gland, the vesicular glands and prostate are present in all excepting the hares. In the porcupine the levator is inserted into an ossicle in the glans. The penial bone is large in the capybara. In the agouti the testicles during the rut are perineal in position. In the *cavia* (guineapig) the os penis is a large flat curved bone situated above the urethra extending to the tip of the glans; below the termination of the urethra is a wide eversible pouch armed with two large horny styles. The surface of the glans is covered with horny scales. In marmots the preputial sac is more distinct from the rectal orifice than in other rodents.

In insectivoræ (males) the descent of the testicles is better marked than in the rat family. In bats the prepuce is long and the penis pendulous. The glans offers strange modifications in some species. The os penis is well developed in the fruit eating bats.

In the armadillo the testicles lie above the rim of the pelvis and do not descend at the time of the rut. A similar condition prevails in anteaters and sloths. In the armadillos the penis is proportionately large, a condition to be expected because of the mechanical obstruction of the body armor. In *Bradypodidæ* the testicles lie between the bladder and rectum; the penis is rudimentary without a corpus spongiosum, as in birds. In females the vagina is divided by a fibrous septum. In *Cetacea* (whales, dolphins, porpoises) the testicles are always abdominal, the vas is short and convoluted. The penis commences by two cavernous cruræ enclosed in strong erectors arising from the loosely suspended ossicle of the same side. These crura coalesce into a single cavernous body. The glans is long and tapering. The corpus spongiosum commences by a bulbous expansion but degenerates as it penetrates the corpora cavernosa. When not erect the penis is hidden in the long preputial cavity, the orifice of which is well in advance of the vent; vesicular glands are absent. The *Sirenia* (sea cows and dugongs) have vesicular glands. The glans consists of semilunar side lobes including a conical process, on the point of which the urethra opens.

The testicles of the elephant (*Proboscidea*) remain below and beyond the kidney. Vesicular glands and a true seminal vesicle are present. There are four prostates, two on each side of the urethra. The corpora cavernosa of the penis is divided by a thick fibrous partition beneath which lies the corpus spongiosum containing the urethra, besides the ordinary muscles there are a large pair of levators.

In *Perissodactyla* (rhinoceros, etc.) the testicles are inguinal. The prostate resembles that of the rat,

being composed of long, slender blind tubes with glandular walls. There is no os. Retractors are present, as are levators and two suspensory ligaments. The total length of the flaccid organ is three feet nine inches; the circumference of the prepuce is one foot five inches. The glans is a long, slender, compressed cone with a truncate apex, and in the undisturbed state, measures one foot in length. The apex of the glans resembles a mushroom on a thick peduncle projecting from an excavation at the end of the glans, with a thin wall, like a second prepuce. On either side of the base of the glans there is a longitudinal thick oblong ridge with a heavy rounded border. The base of the glans penis of the tapir has an upper lobe as well as one on each side, beyond which it is continued forward, contracting and terminating in a truncate surface. The testicles are inguinal, lying in a sessile scrotum.

In the horse the scrotum is suspended nine inches beneath the anus, whence it is prolonged forward, to terminate in the prepuce. The corpora cavernosa is formed by the confluence of the crura without a vertical septum, the glans has two lateral semilunar lobes and at the apex a central pyramidal process. In the castrated horse the retractors of the penis atrophy. In Artiodactyla the chief distinctive character is the enormous development of Cowper's glands. The testes are perineal. The scrotum projects but is not pendulous. The penis shows a sigmoid flexure. The glans is long and pointed. The preputial opening is near the umbilicus.

The ruminants have no vesicular glands; the testicles are carried in a pedunculated scrotum. The glans is long and pointed and in the camel the apex is continued beyond the urethral opening and bent back. Preputial follicles are usually abundant, most marked in the antelopes, reaching enormous size in the musk deer.

CARNIVORA.

The sexes are hardly distinguishable in the seals. The testicles are imbedded in fat between the pubis and the thighs, and the penis makes no outward projection. The preputial orifice is inconspicuous. The glans is pointed and supported by a small os. The os penis of the walrus is massive, about eighteen inches in length. The scrotum when developed in carnivora is hairy and less pendulous than in ruminants. The os penis in bears may be six inches long. The prostate is well developed in the raccoon and other members of the genus *Meles*.

Canis.—In dogs, wolves, foxes, the scrotum is more prominent than in the Mustellines and plantigrades. The prostate is protuberant. The spongy tissue of the urethra expands suddenly and considerably at the base of the glans, which presents an ossicle. The blood is returned from the penis by two dorsal veins. These are compressed by action of the levators arising from the first caudal vertebra, then passing one on each side of sphincter ani to converge to the dorsum of the penis, crossing the veins and terminating at the base of the bulbous portion of the glans. So long as the levators are stimulated to contract after coition the distended glans forms a mechanical impediment to withdrawing the penis from the vagina.

In the hyena the prostate is large, there is no os

penis, the prepuce is large, covers the organ fully and is much the same color, so differing from the dogs. In the cat the glans is covered with retroverted callous papillæ, less numerous in the lion and tiger. The prostate is small, Cowper's glands large. In the nonerect condition the penis is bent backward.

Quadrumana.—In the aye aye (*chiromys*) the testicles occupy a sessile scrotum, the penis projects and is covered by a thin hairless prepuce. In the lemurs the penis has an ossicle and hangs conspicuously as in *chiromys*. In the higher quadrumana and platyine apes the scrotum is more pendulous with a prominent penis. In the spider monkeys (*ateles*) the glans is largely expanded. In *Macacus* the vesicular gland is large and lobate, the prostate large, the os penis small. The testicles are larger than in man and project on either side of the base of the penis. In apes and monkeys the preputial fold is absent.

The chief modification of the mammalian kidney is its composition of a seeming multiplication of simple kidney, with or without a common cortical envelope and an absence of the mammillæ. This last condition is present in the ornithorhynchus, in which the uriniferous tubules terminate on the concave surface of a small and simple pelvis. The ureter takes its course to the contracted neck of the bladder but terminates in the male in the urogenital canal below the vas, in the female beyond the uterine orifice, which thus intervenes between the ureters and the orifice of the urinary bladder. In other respects, save the termination of the ureters in relation to the bladder, the urinary system of monotremes adheres to the mammalian type. This circumstance of deviation places them near the reptiles. The urine in these animals may dribble out with the feces or flow back into the bladder. In either case it is expelled through the cloaca and not through the urethra. The penis in the male is used only for the transmission of semen. In all other mammals the urethra transmits both urine and semen. In some shrews and moles and in the slow lemur the clitoris in the female is perforated by a canal which is here used exclusively for the urine, the vaginal orifice intervening between the anus and clitoris.

The scope of this review does not permit me to take up the question of deviation of the female organs of generation, or the secondary sexual characters found in animals.

In closing, we must remember that we, as the highest order of mammalia, are not in fact so far removed from the lower types and that at one time in the past our first ancestor, a reptile, prompted by a warmer blood and a more efficient circulation, dragged its sinuous length from the alluvial slime to seek surroundings more congenial. By this first effort, be it accidental or otherwise, the chain of advance was started, so during the millions of years that have since elapsed we have developed link by link till now the human race stands at the top.

No claim of originality is made in this communication. It is, as stated, simply a review. I have quoted freely from many authors, among them Sir Richard Owen's comprehensive works on *Comparative Anatomy*, Flower and Lydekker's *Mammalian Zoology*, Dr. H. C. Chapman and other writers.

MODERN TREATMENT OF SYPHILIS.

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In this article I shall epitomize the rationale of my methods of procedure in the usual case of syphilis. No attempt is made to describe special plans of attack employed for those special types of cases, like congenital syphilis, nor, for those cases where specialized tissues, like the nervous system, are involved. Of course, it must be understood that all measures conducive to the promotion of good health should be employed and that much depends upon the cooperation of the patient.

Syphilis is an infectious constitutional disease caused by the *Spirochæta pallida*. From a local point of inoculation, where the chancre develops, the organisms migrate with the blood stream and the lymph current to all parts of the body, causing anatomical and physiological changes in the organs. Thus, after a primary incubation period, and a localized initial lesion with enlarged adjacent lymph nodes, the infection, at the end of a second incubation period, usually of four to six weeks, manifests itself as a generalized condition. The infection is slowly diluted and appears usually at the end of a year or more by localized evidence of the disease. The course of the disease is, therefore, conveniently described in three stages; the primary, the secondary and the tertiary. The pathological changes of syphilis in all its phases are essentially the same and are characterized by the presence of a granuloma which is made up of a perivascular infiltration of small round and plasma cells. The various lesions are merely expressions of different degrees of intensity in the reaction of the tissues to the excitant. The older lesions are affected by a more marked endarteritis and periarteritis and a greater substitution of the cellular tissue by fibrous tissue.

It is evident that the cure of the disease depends upon the destruction of the spirochetes and the restoration of the normal anatomy and physiology of the affected tissues. The destruction of the organisms is effected by the administration of specific spirocheticidal remedies and the employment of measures to stimulate the resisting forces of the body. By the internal administration of iodides the spirochetes are destroyed, the pathological tissues are removed and the normal structure regained. With the destruction of the spirochetes and the development of normal tissue the normal functions return, which at times are aided by methods of reeducation. Where special tissues have been destroyed and replaced by scar tissue there may be no return of function or only a partial return.

THE SPIROCHETICIDES.

Arsphenamine and its congeners, and mercury are spirocheticides. While less bactericidal than mercury arsphenamine is a more powerful spirocheticide, exerts a more rapid and destructive action on the organisms and is a tonic to the system. Mercury is only slightly spirocheticidal but possesses

the power to stimulate the body to resist the syphilitic invasion, and favors the absorption of newly formed connective tissue. Therefore, arsphenamine is indicated in all phases of the disease, especially for the destruction of the spirochetes while they are still localized in the chancre and after they have invaded the system prior to their entrenchment behind obliterated blood vessels and masses of fibrous tissue. The drug will not cure syphilis in a single dose, nor, with rare exceptions, in a single course of several doses, but it will eradicate the disease when given in a systematic, scientific manner for several years. The combined administration of both specifics, arsphenamine and mercury, gives the best results. They destroy the spirochetes and stimulate the production of antibodies.

REMOVAL OF PATHOLOGICAL TISSUE.

Arsphenamine and mercury, by destroying the spirochetes, remove the factors which incite the formation of the pathological tissue and thus favor involution. Mercury also shows a tendency to stimulate the absorption of the poorly formed connective tissue. Iodides, once considered specific in their action, are now known to be without effect upon the organisms, but they are of immense value in removing abnormal tissue and opening the way for arsphenamine and mercury. The removal of the pathological tissue is possibly favored by the inhibitory action of iodine on the antiferments and thus permitting the normal proteolytic ferments to digest the infiltrations. By producing prolonged vasodilatation the iodides improve the circulation through the tissues. It is also possible that the action of iodides upon the thyroid gland may aid by stimulating the antiseptic action of the secretion and by promoting absorption of infiltrations. It has been said that the main signs of hypothyroidism depend upon the development of infiltrations and it has been shown that stimulation of the thyroid or the administration of the gland extract will cause the disappearance of these infiltrations.

VARIOUS PHASES OF SYPHILIS.

For purpose of treatment it is advisable to consider the three stages of syphilis as follows:

Primary stage.—This includes the primary incubation period as well as the phase in which the chancre and the adjacent adenitis are present; the spirochetes are localized and there is a negative Wassermann reaction of the blood.

Secondary stage.—a. A preflorid phase in which there is evidence of primary lesions usually still present, there is no clinical evidence of general syphilis, but the blood shows a positive Wassermann reaction. b. In the florid phase there are clinical signs and symptoms of active secondary syphilis and there is a strong positive Wassermann reaction of the blood. c. A declining or latent secondary phase which shows fading or no clinical evidence of secondary syphilis. The blood shows a strong positive Wassermann reaction.

Tertiary stage.—a. In the latent tertiary phase there is no clinical evidence of syphilis but there are positive biological findings in the blood or spinal fluid, or a positive luetin reaction is found. b. This

is followed by an active tertiary phase in which there is evidence of tertiary syphilis of the skin or viscera with or without positive biological findings in the blood or spinal fluid and a positive or negative luetin test.

SPECIFIC TREATMENT.

In view of the fact that in primary syphilis the spirochetes are still localized and the prognosis for a cure is most promising during this phase of the disease, the attempt is made to destroy the organisms *in situ* by vigorous, intensive treatment. Wide divergence of opinion exists as to the best manner in which the abortive treatment should be applied. There are some who advocate the administration of several doses of arsphenamine daily, while others assert that weekly injections of several moderate doses of the drug are sufficient. I have tried a medium course and have employed the following method of abortive treatment with success.

It is urged that the initial lesion or its scar if indurated should be completely extirpated whenever the site allows of such an operative procedure. By excising the lesion it is not proposed to cure or abort syphilis but merely to remove a possible focus from which spirochetes may invade the blood and lymph channels. In those cases where it is not feasible to excise the chancre, local cleanliness and the continuous application of a thirty per cent. calomel ointment are prescribed.

Combined administration of arsphenamine and mercury consists in the administration of four intravenous injections of arsphenamine in doses of three tenths gram at intervals of three days followed by a course of six intravenous injections of arsphenamine in doses of four tenths gram at five day intervals. Two days after the fourth injection of arsphenamine an intramuscular injection of a grain of mercury salicylate is given.

The mercury is then administered in the same dose two days after each of the last six arsphenamine injections. It is then continued in doses of one to three grains at intervals of five days until a course of twelve has been completed. As the chancre shows endarteritis and new connective tissue potassium iodide is prescribed in daily doses of thirty grains after the completion of the course of arsphenamine.

The patient is now given a rest from treatment for a month after which the Wassermann reaction of the blood is determined. If the reaction proves positive the patient is advised to undergo the plan of treatment which will be described for the declining phase of the secondary stage. A negative Wassermann reaction is followed by a course of four weekly injections of arsphenamine in doses of four tenths gram and twelve weekly injections of mercury in doses of a grain. A final Wassermann reaction of the blood justifies a lumbar puncture for examination of the spinal fluid. If the spinal fluid does not show any biological evidence of syphilis the patient is told that he is apparently cured but advised to undergo a general physical examination every six months and an examination of the blood every two months for a year and then annually for the rest of his life.

During the preflorid phase of the disease there

are no clinical signs of general infection although the Wassermann reaction of the blood is positive. It seems possible that such a positive reaction may occur early in the disease on account of the reagent which escapes into the blood from the initial lesion. In view of this and also because there are few spirochetes in the blood and they are not firmly established in the tissues the abortive treatment should be attempted. As a precaution against violent focal or general reaction five minims of a one to one thousand solution of adrenalin is injected subcutaneously prior to the first four injections of arsphenamine. The development of a reaction should be followed by the plan of treatment employed for the florid phase; the absence of a reaction warrants the further application of the intensive treatment.

During the florid phase the spirochetes are widely disseminated they swarm in the blood, invade all the tissues and overwhelm the general system before the natural resisting forces of the body are fully mobilized. The blood shows a four plus Wassermann reaction and the various clinical signs and symptoms of active secondary syphilis are present.

As there is no hope of completely eradicating the spirochetes by a course of intensive treatment during this phase and because violent reactions may result, a more conservative plan of attack is strongly recommended. The employment of arsphenamine at this time results in the destruction of large numbers of the organisms, the consequent liberation of an enormous amount of endotoxins which may intensify the local and the general phenomena of the disease and overwhelm the patient. This phenomenon is known as the Herxheimer reaction. The production of such a reaction in the nervous system gives rise to symptoms of temporary embarrassment or permanent destruction of tissue, as in the case of the third, seventh and eighth cranial nerves which traverse compact bony apertures and canals. It is therefore desirable to employ a method of treatment which diminishes the tendency to these reactions, destroys a certain number of organisms and favors the development of the resistance of the body to the invasion.

The procedures followed in florid syphilis may be described in three steps.

1. A series of soluble mercury injections. Mercury is spirocheticidal in action but to a far less extent than arsphenamine. Its employment liberates a much smaller amount of endotoxins and the possibility of reactions is much diminished. The use of the drug also tends to favor the development of the natural resisting forces of the body. Soluble mercury should be injected for this purpose because it is painless, absorbed quickly and the desired effect obtained rapidly. A two per cent. solution of mercury cyanide is injected daily for six days; the first dose of eight minims being increased one minim with each injection.

2. Combined arsphenamine and insoluble mercury injections. At the termination of the series of soluble mercury injections the patient is given six weekly injections of arsphenamine in doses of three tenths to five tenths gram. Two days after each injection of arsphenamine a grain of mercury salicylate is injected intramuscularly.

3. A course of insoluble mercury injections. Twelve weekly injections in doses of one to three grains are then administered.

This is followed by a period of rest during which potassium iodide is given. The Wassermann reaction of the blood is now determined. A positive reaction should be followed by a repetition of the combined administration of arsphenamine and mercury salicylate. A negative reaction after the first or second course of treatment should be followed by courses of four weekly injections of arsphenamine in doses of four tenths gram and twelve weekly injections of mercury salicylate with rest periods of two months for at least three years. The Wassermann reaction of the blood is determined at the end of each rest period. Iodides should be taken on and off during the entire course of treatment.

If the patient comes under treatment six months to one year after the appearance of the chancre, or the declining phase, we find reminders of lesions characteristic of the secondary stage and a strong positive Wassermann reaction. On the other hand, there may be no evident signs but subjective symptoms of the general infection and a strong positive Wassermann reaction.

In such patients Nature has been given the opportunity to resist the invasion of the disease. The antibodies in the blood and tissues are mobilized in sufficient force to repel the onslaughts of the spirochetes and gradually dilute the infection. The plan of therapeutic attack employed in this phase is similar to that in the florid phase but the preliminary course of soluble mercury is omitted. This omission is warranted because there is little or no danger from a Jarisch-Herxheimer reaction.

In the latent tertiary phase many syphilitic patients show no visible signs or subjective symptoms of the disease, yet upon testing the blood for the Wassermann reaction, a weak and at times a strong positive result is obtained. This latent phase develops a year or more after the onset of the infection and is occasioned by the attenuation of the infection by insufficient therapy in the past or by nature.

In those instances the spirochetes are not present in the blood but are entrenched in various localities behind fibrous tissue and vessels with partially or completely obliterated lumina. After a preliminary course of eight weekly injections of arsphenamine in doses of four tenths gram there follows a course of twelve weekly injections of mercury salicylate and iodides by mouth. At the completion of this course a period of rest from treatment follows and the Wassermann reaction of the blood determined. Subsequent to this courses of four weekly arsphenamine injections in doses of four tenths gram and twelve weekly injections of mercury salicylate are given twice a year for three years.

Iodides are given while the patient is receiving mercury and during the rest periods. I prefer giving the saturated solution of potassium iodide in essence of pepsin. The mixture is employed by pouring the required amount into a glass of milk and the curds which form are ingested after meals.

Evidence of active tertiary syphilis may develop at any time. The gummatous tumor which is the

characteristic lesion of this phase is made up of a dense mass of connective tissue, plasma and round cells and blood vessels with marked endarteritis. I have pursued the following scheme in the treatment of syphilitic patients with signs of visceral or cutaneous gummata.

1. The administration of potassium iodide in daily doses of one to two drams.

2. Weekly injections of arsphenamine until the disappearance of the lesions.

3. An injection of mercury salicylate two days after each injection of the arsphenamine.

4. With the disappearance of symptoms referable to the lesions, or of the lesions themselves, mercury is continued in weekly injections for three months.

5. Subsequent treatment is similar to that suggested for latent syphilis. In the presence of tertiary syphilis of the viscera this plan is generally employed but precautions must be taken against increasing the damage to the organs.

I recommend the routine method of treatment outlined above in those cases which run the usual course. The local treatment of syphilis may be obtained from the various textbooks and monographs. Criteria for an apparent cure are: repeated negative Wassermann reactions of the blood and negative clinical findings for at least one year after stopping treatment, a normal spinal fluid and a negative luetin skin test. Even in the presence of all these the patient who has once had syphilis is told to receive annual physical examinations and occasional Wassermann tests of the blood.

161 EAST SEVENTY-NINTH STREET.

THE CONQUEST OF VENEREAL INFECTION.

BY ETTIE A. ROUT,
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New Zealand Government Authorized Reporter and Honorable
Secretary New Zealand Volunteer Sisters.

Some fifteen years' experience as an official reporter in Australia and New Zealand, and some five years' work at home and in Egypt, France, Belgium and England gave me a general knowledge of the nature and extent of the venereal disease problem. The set purpose to send home as many clean men as possible was kindled by the vivid realization of what it meant to the women at home that in a few months some ten thousand Anzacs had become infected with venereal disease in Egypt. Moral measures having proved insufficient, obviously they must be supplemented by medical effort. Would this succeed? Then I did not know. Now my general knowledge, combined with several years' experience with the practical application of prophylaxis—mainly among overseas Britishers and Americans—makes me feel that victory is now attainable by all who are willing to think clearly and act courageously. Our worst failures in the army were due to the fact that we were caught napping. Our successes, and they are completely convincing, were due to the fact that we combined means of lessening contacts with methods of eliminating dis-

ease. Not merely must we try to prevent sin, but we must try to prevent the poisoning of the sinner; for if not, we shall have blind babies, invalid wives, and ruined husbands; broken hearted, broken bodied mothers each adding one more fragment to the Nation's pile of damaged goods.

Early in the war because of an outbreak of venereal disease in Egypt, one of our brigadier-generals visited a number of young, educated men in one of the camps, and asked for their viewpoint. They said that many of the men were influenced by the moral appeals made to them, but that a proportion of the men had indulged in this way throughout their adult life, and intend to continue to do so irrespective of anything medical officers, chaplains, or generals might say to them. That is the fundamental position which every reformer must face. So long as a number of men determine to adopt this policy, and so long as there is a sufficient number of women prepared to cater to them, the problem of venereal disease will continue to be acute in every country.

How then was venereal disease conquered in the Army? First, Was it conquered? It certainly was. Wherever prophylaxis was properly applied, at least two thirds of the cases of venereal disease were eliminated. That is the official statement of the American Army, and it coincides with that of the Canadian and Australian armies, on broad lines. In particular cases enormously better results than this were attained. For example, in August-September, 1917, over five thousand British troops came to Paris on leave without prophylactic measures being provided, and 1,038 became infected, over twenty per cent. Leave was then closed down; three prophylactic stations were established, and prophylactic tubes were issued, with the result that although during the next six months some twenty-five thousand to thirty thousand troops came on leave to Paris, the amount of venereal infection among them was reduced to less than three per cent.

By a special additional effort in Paris, backed up officially and unofficially by the Australian Army authorities, I succeeded in making the Anzacs the cleanest troops that ever came on leave to Paris. In five months we had only twenty venereal infections recorded against us at the Medical Report Centre, whereas many hundreds of infections were recorded against other troops. It is noteworthy that in November-December, a period of five weeks, when our supplies of prophylactic outfits ran out, we had twenty-four infections to our discredit, four more than during the previous five months. The most striking return was one furnished for the twenty-two days ending October 17, 1918, because a special medical effort was made to protect the Anzac troops during September-October, the result being as follows: Venereal infections recorded at Medical Report Centre, Paris, for twenty-two days ending October 17, 1918, no New Zealanders, no Australians, thirty-three Canadians, and twenty-four English, and a further return for the six weeks ending October 31, 1918, gave us only three infections among the Anzac troops and forty-two among the English. As the New Zealanders and Australians were the only troops given an unlimited supply of

prophylactic outfits, the conclusion is obvious. I am sure that when men and women are properly instructed in the mode of preventing infection, and are supplied with the necessary medicaments, venereal disease can be practically extirpated except among the drunken, and experience shows quite clearly that the vast majority of those who risk infection are not in a state of alcoholism when they do so; on the contrary they are able to take care of their health if they know how and the means are available. Further, the providing of these means does not act as an incentive to immorality: rather it is a continual reminder of the dangers likely to be incurred by loose and irregular relationship—hence a deterrent rather than an incentive to immorality.

Similarly the establishment of prophylactic stations was never misunderstood by the soldiers as an encouragement of vice, rather they argued that the menace to their health and efficiency must be extraordinarily great, or the Government would not incur the expense and deep odium of setting them up. Some differences of opinion existed among medical officers as to whether the issue of disinfectants, in a portable form, was advisable or not. Experience proved that disease could certainly be reduced by this method, and the danger to morality was merely a surmise, neither provable nor disprovable. Certainly experience proved that large numbers of men and women were able and willing to take suitable precautions to insure hygienic safety, and those who take the responsibility of suppressing a knowledge of prophylaxis from them must also be held responsible for the resulting spread of disease among the innocent—born and unborn. The hardest fanatic shudders from such a responsibility, and in the end is driven to admit that the world will not be rendered less moral by the abolition of venereal disease—only cleaner and happier for all of us.

Thus one hails with relief the news that the Portsmouth area, which has long been notable for the extraordinarily efficient control of venereal infection, secured by Sir Archdall Reid, by means of a potassium permanganate lotion, has now decided on the advice of its medical officer of health to apply the same system to the male civilian community. The following figures are interesting in this connection:

In 1917 the Army venereal disease rate for the whole of the United Kingdom was thirty-eight to the one thousand, and for Portsmouth town ninety-two to the one thousand; in 1919 the United Kingdom rate had risen to sixty-four, whereas Portsmouth town had fallen to fifty-four and four tenths, and Portsmouth area (Dorsetshire and Hampshire) to forty-seven and seven tenths, the Portsmouth area rate in 1919 minus disease imported from overseas being only thirteen to the one thousand soldiers. In France the increase was even greater among British soldiers than in the United Kingdom. In 1917 the British Army rate was twenty-seven to the thousand for 1917; in 1919 it had risen to over eighty to the thousand, and in 1920 it is still higher; whereas among the American troops, I am authoritatively informed, there has been

a steady decline. This would appear to be partly due to the simple and serious instruction in prophylaxis given to all enlisted men, and partly to the more adequate and efficient establishment and maintenance of prophylactic stations, and the much greater prominence given in American areas to the notice boards. Prophylaxis had been adopted officially; then it had to be put into proper practice; and the Americans were able to build up their system more surely and quickly because of their careful study of the past mistakes of other armies. Hence one is not altogether surprised to learn that under the supervision of the commissioner of health, Dr. Edward Martin, sixteen prophylactic stations have been established in different cities and towns throughout the State of Pennsylvania; and that, as part of the campaign against venereal disease, suitable packets of disinfectants have been put on sale in the drug stores. This is an extraordinarily valuable effort not merely to the United States of America, but to all English-speaking nations, for the social and sexual habits of all these nations are much the same. The American solution of the question of the distribution of packets strikes one as eminently practical. Most Anglo-Saxon communities are sufficiently advanced to accept the prophylactic station as a necessary institution, but they feel really anxious and unhappy about accepting the responsibility of distributing disinfectants, or on the other hand of forbidding such distribution. If private enterprises put suitable disinfectants on sale, the general public would prefer to accept this as evidence of the demand. It seems a pity they should be necessary, of course, but while they are necessary, it is a question of individual responsibility. All this proves there has been something wrong with the sexual education of men and women, let us try and do better with the next generation.

"The crux of the position lies with the woman, as regards the man we know pretty well what to do and how to do it. But as regards the woman, we neither know what to do, nor how to do it." These words were said to me some three years ago by a thoughtful Scotch doctor, in urging the necessity for establishing toilet rooms for women, a scheme he thought within the bounds of possibility, and more in accordance with Anglo-Saxon sentiment than licensed houses. One or two tentative experiments were made on the continent during the war, and we found that French and Belgian public women were quite ready to attend a Red Cross dispensary for prophylactic treatment, and quite ready to accept prophylactic outfits from the soldiers (we had the directions for women printed in French and English). In the licensed houses, of course, the women and the men always practised prophylaxis, and from properly conducted houses, such as those in Paris, we got practically no disease at all. But the mere existence of licensed houses in any area certainly offers no solution of the problem of venereal control, though personally I believe it helps to limit both disease and immorality to the classes of women to which it naturally belongs: that is, to the women who either cannot or will not refrain from the anti-social act of offering promiscuous and loveless relationship to men. Probably the majority of such

women are not bad at all but merely temporarily oversexed and perhaps going through a phase in the life history of the race which other women are born fortunate enough to avoid—and certainly most of the so-called bad women are willing for their own sake to take precautions against disease. Why then debar them from obtaining that knowledge in a clean and efficient manner? Doesn't one diseased woman spread disease much more than one diseased man? Why then confine ourselves to protecting men only?

As a fact, the advice we give to men is often quite useless, because it is given too late. If the man is already infected, and knows it, he will not trouble to apply prophylaxis. In a mercenary relationship, both parties are quite conscienceless. In marriage we have many cases of wives being infected by their husbands, and reinfected, and they will not let the doctors deal effectively with their husbands. The production of a health certificate by the man and the woman before marriage would lessen the number of such cases; but the spread of a knowledge of sexual hygiene among women would do far more.

Opposition to the spread of such knowledge can be removed by insisting on the fact that the venereal diseases are not immorality diseases. By typewritten circular letters and short lectures I have found no difficulty in putting this view clearly before thousands of soldiers during the war, and the inducements of self interest and reputation are enormously stronger among civilians than among soldiers; hence similar advice given quietly and straightforwardly to adult men and women would be even more effective in civilian life. Briefly, this is the advice I gave:

The microbes of venereal disease grow almost exclusively in the genital passages of men and women. If these passages are kept clean and disinfected, the microbes will not grow. Venereal disease does not always spring from immorality, or even from sex relationship, but from contact with infective matter. You had far better not risk such contact, but if you do, cleanse and disinfect yourself at once. Using some sort of grease beforehand prevents direct contact, the microbes will not pass through a film of oil, for they are gummy. They will not adhere to a greasy surface, hence they are easily washed off with soap and water after contact, and soap is destructive of the microbes—both of syphilis and gonorrhoea. It is seldom that a person who has used vaseline beforehand and soap and water afterwards becomes infected; if so, that merely proves that the precautions were carelessly carried out. Urinating immediately after contact is also a protection. Bathing with cold water is also protective. There is no excuse for doing nothing, and little excuse for delay; but if there has been delay, you should seek skilled treatment as soon as possible. The kind of precautions necessary to ensure protection is dependent on the kind of risk run. Only the persons themselves know the nature of the contact, the length of time occupied, the number of repetitions, and so forth. Contact with infective matter for a few moments is one thing; contact with infective matter for a whole night, quite an-

other. But every irregular contact is a risk; avoid risks, or if you disregard this advice, disinfect immediately. Do not let anybody persuade you that promiscuous relationship is safe. It never is, and do not let anybody mislead you into believing that disinfectants do not disinfect; they certainly do. If you become infected, the fault is really your own. You should not have risked infection; or, risking infection, you should have taken proper precautions. If you insist on making these your habits, then you had far better carry a town dressing with you, in the same way as a soldier carries a field dressing. You will give yourself a double chance of safety by taking your own emergency precautions, and reporting for prophylaxis at the prophylactic station as well.

From the Australian depots, prophylactic outfits were available without cost and small syringes and rubber protectors were on sale at nominal prices. In Paris we had twelve prophylactic stations, one English, two Canadian, one Australian, and eight American. We prevented as much disease as possible; when we failed, we cured as early as possible; and we did our best to reduce concealment to a minimum. Nevertheless, as a result of war and after war conditions, venereal disease has greatly increased in all the Allied and enemy countries; probably no European country has less than three or four times the amount of disease it had in 1913-14. Once in the life time of every generation, all mankind must pass through the bodies of its women. Shall we make and keep those bodies clean? Knowledge has given us power, and with this new power we shall be able to rid our nation of the most dreadful of all human scourges. Victory is within sight. When it comes sex will regain its loveliness.

RESULTS IN THE TREATMENT OF NEUROSYPHILIS

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A review of the results of treatment of neurosyphilis, as conducted by the urological service of the Brooklyn Hospital during the calendar years of 1918 and 1919, has proved of great interest to me and a brief survey of that review is presented here, with the hope that it may be of interest to those who are sceptical as to the value of intraspinal therapy. It is not my intention to disclose any new or startling discoveries in the treatment of neurosyphilis, but to state the results of treatment by a method which in our hands has given better results than the older methods.

In order to treat neurosyphilis, with a hope of obtaining results, treatment must be instituted as early as possible. Since the spinal fluid is involved in from sixty to seventy-five per cent. of cases during the secondary stage and in twelve to twenty-five per cent. of the cases the pathological changes of the fluid persists, it behooves us to be on the watch for early involvement of the central nervous system. A

lumbar puncture is therefore indicated in the following cases:

1. All cases coming under observation after the primary stage has passed, as a diagnostic procedure. This includes patients who have been treated and latent or tertiary cases where treatment has been neglected.
2. Patients who have been under active treatment for eight to twelve months, with no improvement in the blood Wassermann.
3. To differentiate between involvement of the nervous system of syphilitic and nonsyphilitic origin.
4. As a diagnostic measure before discharging a patient as cured.

During the two years covered by this report we performed diagnostic punctures in sixty-one cases, which included syphilitic patients who had symptoms referable to the nervous system and those who were ready to be discharged. Out of that number eleven, or eighteen per cent., gave positive fluid findings showing involvement of the central nervous system. Out of the eleven cases, two or three per cent., were in women. The smaller proportion of positive findings in women is due to the fact that we find it more difficult to convince women of the advisability of having a lumbar puncture performed.

During the same period we gave 210 intraspinal treatments to forty-two patients. The number of treatments given to any patient varied between one and thirty. The ages of the patients varied between twenty-one and fifty-eight. Between the ages of twenty and thirty, four patients, or ten per cent.; between the ages of thirty and forty, nine patients, or twenty-two per cent.; between the ages of forty and fifty, twenty-two patients, or fifty-two per cent.; between the ages of fifty and sixty, seven patients, or sixteen per cent. Of the forty-two patients ten were single and thirty-two were married, which also includes one single and one married female patient. Our series of forty-two cases were divided clinically as follows: Twenty-nine cases of tabes, or sixty-eight per cent.; twelve cases of cerebrospinal syphilis, or twenty-nine per cent.; one case of paresis, or three per cent. Our diagnosis in each case was determined by history, physical examination, blood Wassermann and spinal fluid examination.

The opinion held today by such syphilographers as Fournier, Kaposi and Newman, and by such neurologists as Heubner, Gilbert and Kuh, is that in those individuals who have had no antispecific treatment or insufficient treatment, syphilitic involvement of the nervous system is likely to develop. On the other hand, Collins in a study of ninety-six cases of tabes concludes that a thorough treatment of syphilis neither prevents nor postpones the development of syphilitic nervous disease which occurs later rather than earlier in cases not thoroughly treated.

In going over the histories of our series of cases, I was able to find references to early treatment in thirty-four cases only. In nineteen cases, or fifty-five per cent., the patients had had no treatment at all; in four cases, or eleven per cent., they had had only local treatment; in four cases, or eleven per cent., they had had mercury pills by mouth for vary-

ing periods; in six cases, or seventeen per cent., they had had one course of treatment, and in two cases, or six per cent., they had had two courses of treatment. In other words, in sixty-six per cent. of the cases the patients had had no constitutional treatment whatsoever before the onset of symptoms.

We have had a few patients in whom neurosyphilis developed a few months after the appearance of the initial lesion, even though they were energetically treated from the outset. There are no doubt several strains of *Spirochæta pallida*, some more potent than the others and some that have a predilection for nerve tissue. In a patient with lowered resistance and infected with a strain of a malignant type of spirochete involvement of the nervous system is more likely to occur with astounding rapidity in spite of early and well directed treatment. In the face of our results, we are convinced that the cases treated vigorously from the start are less likely to be complicated by neurosyphilis. Even though authorities disagree on the value of antispecific treatment in preventing involvement of the nervous system, we should not conclude from these observations that syphilis in whatever stage it is seen should not be thoroughly and energetically treated.

In our series the earliest involvement appeared seven months after the initial lesion in the form of optic atrophy. Our records also show some cases in which manifestations of involvement of the nervous system did not appear for thirty-eight years after the appearance of the chancre. The average duration of time for the appearance of symptoms referable to the nervous system was twelve years and eleven months.

The treatment employed in our series was the Swift-Ellis method, which in detail is as follows:

One hour after the intravenous administration of salvarsan (.4 to .6 gm.) forty mils of blood is withdrawn and allowed to clot, after which it may be centrifugalized. The following day twelve mils of the serum is pipetted off and diluted with eighteen mils of sterile normal saline solution, making a forty per cent. solution. The serum is heated at 56° C. for half an hour, after which it is ready for intraspinal injection. A lumbar puncture is then performed in the usual manner and the salvarsanized serum is allowed to run slowly into the spinal canal by gravity. The intraspinal treatments were given at intervals of one to three weeks depending upon the condition of the patient and the reaction following the injection. Treatments were given in courses of six to eight injections and intervals of four to six weeks allowed between courses.

Fordyce sums up the rationale of intraspinal therapy in these words: "It does not require the experience of a trained neurologist to convince these patients that their condition has been changed from hopeless invalidism to comparatively good health. The advocates of intraspinal therapy have never claimed for the method that it should be used to the exclusion of the intravenous, nor have they claimed that the choroid plexus is impermeable in all cases and that remedies introduced intravenously could not reach the cerebral or spinal tissue." The intravenous

administration of salvarsan can be employed in early cases of cerebrospinal syphilis (meningitis, meningomyelitis, meningoencephalitis), early cases of tabes, and syphilitic epilepsy. In these classes of cases, the improvement both clinically and serologically is fairly rapid under intensive treatment, but at times we see patients, who have not responded to intensive intravenous treatment, show marked and rapid improvement by combined intravenous and intraspinal treatments.

The following histories and laboratory findings are submitted as illustrations of our results with the Swift-Ellis method:

CASE I.—Diagnosis, tabes. F. H., a man, fifty-eight years old, reporting for treatment in November, 1917, with a history of chancre twenty years previously. Had had local treatment and the sore disappeared in a short time. For the last ten years had had shooting pains in lower extremities and occasional pains in joints. Walked with difficulty. Had incontinence of urine for several years which necessitated the wearing of a urinal. Physical examination revealed the following condition: An anemic male of slight build; fundi, negative; pupils, unequal and irregular, both light stiff; knee jerks absent; Romberg, plus two; sphincters, vesical incontinence complete; rectal incontinence at times; gait ataxic, facial and lingual tremors absent; toe-heel impossible without support; speech, slight defect on test phrases; mental condition negative; sensory, lancinating pains in legs; blood and spinal Wassermanns, four plus.

On November 15, 1917, the patient had albumin in urine; administration of salvarsan postponed. He received three injections of mercury salicylate at weekly intervals and increasing doses of potassium iodide. On December 6, 1917, there was no albumin in the urine, and he was given six Swift-Ellis treatments at weekly intervals. On January 17, 1918, the patient could hold his urine for three hours and the urinal was discarded. His gait was improved. For the next year he received weekly injections of mercury salicylate and moderate doses of potassium iodide.

In this case both clinical and serological improvement was satisfactory. The patient works all night and is able to hold his urine without any difficulty.

SPINAL FLUID				BLOOD WASSERMANN	
Date	Cells	Globulin	Wass.	Date	Result
11-20-17	50	positive	4 plus	11-20-17	4 plus
7-18-18	22	positive	2 plus	7-18-18	negative
1-19-19	7	negative	negative	11-8-18	negative
8-8-19	7	negative	negative	1-19-19	negative
4-15-20	6	negative	negative	8-8-19	negative
				4-15-20	negative

CASE II.—Diagnosis, tabes. S. Z., a man of thirty-three, reported for treatment in April, 1918, with a history of chancre nineteen years ago, followed by a maculopapular rash and sore throat. Did not receive any treatment until four years ago when he began to complain of a sore throat and stomach trouble. Was treated by his family doctor and at several hospital clinics where he received twelve salvarsan and about two hundred mercurial injections. At present complains of shooting pains in legs and back, dyspepsia, slight congestion of throat, spots appearing before right eye and difficulty in seeing with right eye.

Physical examination revealed the following: A

thin male with bony frame, fair musculature; fundi clear; pupils moderately dilated and fixed to light; Romberg absent; knees, right plus two, left plus minus; sphincters, O. K.; gait normal; Babinski absent; no facial or lingual tremors; no ataxia of upper or lower extremities; speech O. K.; mental negative; blood and spinal Wassermanns four plus.

Beginning April 4, 1918, he received six Swift-Ellis treatments at weekly intervals, followed by twelve mercury injections at intervals of four days with increasing doses of potassium iodide. Beginning July 11, 1918, he received six more Swift-Ellis treatments at weekly intervals, followed by weekly injections of mercury salicylate. The patient now feels much better and the pains in legs and back have disappeared.

SPINAL FLUID				BLOOD WASSERMANN	
Date	Cells	Globulin	Wass.	Date	Result
3-12-18	46	positive	4 plus	3-12-18	4 plus
4-14-18	46	positive	4 plus	8-2-18	negative
4-12-18	38	positive	3 plus	2-26-20	negative
4-19-18	..	negative	2 plus		
4-26-18	..	negative	2 plus		
5-3-19	14	negative	1 plus		
5-10-18	16	negative	negative		
7-12-18	12	negative	negative		
7-19-18	10	negative	negative		
8-2-18	18	negative	negative		
9-20-19	10	negative	negative		

CASE III.—Diagnosis, tabes. J. W., a man of thirty-seven, reported for treatment in September, 1916, with a history of chancre fourteen years ago. Had trouble in walking for past two years, and for past four months had had lancinating pains in legs. He also suffered from headaches.

Physical examination revealed a thin male weighing 125 pounds. Pupils unequal and irregular, both light stiff; knee jerks absent; gait ataxic; speech, slight defect on test phrases; mental, memory for business affairs O. K.; distinct memory defects for articles used and acts performed in daily life; sensory, lancinating pains in legs; blood and spinal Wassermanns, four plus.

Between September, 1916, and July, 1920, he received ten intraspinal treatments, twenty-one treatments with salvarsan, about one hundred injections of mercury and potassium iodide administered internally. About March, 1917, he complained of severe headaches and tremors, the latter occurring when he was in bed, from no apparent cause, and referred especially to the left foot. After a few injections of mercury and potassium iodide internally, the headaches were relieved.

About October, 1918, our notes showed that he did not walk as well as formerly, his steps were heavier than usual and when he bent over he trembled. He was then energetically treated with ten intravenous injections of salvarsan when he improved somewhat. In February, 1920, he began to have difficulty in walking, with renewal of headaches. He was given four Swift-Ellis treatments and improved somewhat.

SPINAL FLUID		BLOOD WASSERMANN	
Date	Wass.	Date	Result
9-7-16	4 plus	9-7-16	4 plus
1-25-18	1 plus	3-16-17	negative
2-3-18	1 plus	3-6-19	negative
3-15-18	negative	7-2-20	negative
3-22-18	negative		
4-5-18	negative		
4-12-18	negative		
7-2-20	negative		

The records for the reports of the spinal fluid in this case were lost up to the spinal fluid taken

on January 25, 1918. The patient had received up to that time four intraspinal treatments, eight salvarsan treatments and thirty injections of mercury. In this case there was marked serological improvement, with but slight improvement in the symptoms.

CASE IV.—Patient I. P. Diagnosis, cerebral type central paralysis, involving right arm, right side of face, and right leg; date of infection September, 1917. Onset of symptoms, November, 1918. The patient had received six doses of salvarsan and twenty injections of mercury salicylate between infection and paralysis. Symptoms developed three months after cessation of treatment. He received three intraspinal treatments of salvarsanized serum and three treatments of mercurialized serum. In the course of treatment, edema of lower extremities and marked albuminuria developed which could not be accounted for by cardiac or renal deficiency under careful medical study. This edema was always less following lumbar puncture. The paralysis had completely disappeared, and on account of the edema and albuminuria we discontinued the Swift-Ellis treatments.

SPINAL FLUID		BLOOD WASSERMANN	
Date	Wass.	Date	Result
11-15-18	4 plus	11-15-18	4 plus
11-22-18	4 plus	7-7-20	negative
12-3-18	4 plus		
12-6-18	4 plus		
12-11-18	4 plus		
12-18-18	4 plus		
7-7-20	3 plus		

The patient could not take further spinal treatment at this time, but seemed to be in excellent condition. Even though there was improvement in the blood Wassermann and but slight improvement in spinal fluid, clinically he made an excellent recovery.

CASE V.—Patient, C. R. Diagnosis, tabes with optic atrophy. Date of infection unknown. The patient had had two courses of treatment, but had been two years without treatment. Had had four salvarsanized intraspinal treatments and three mercurialized serum treatments at weekly intervals. At time of beginning treatment the blood Wassermann was three plus; spinal Wassermann ten plus. At completion of this course of treatment, patient felt well, resumed work, and was absolutely steady on his feet, though totally blind.

SPINAL FLUID		BLOOD WASSERMANN	
Date	Wass.	Date	Result
6-10-18	10 plus	6-10-18	3 plus
2-8-19	5 plus	2-14-19	negative
2-14-19	5 plus		
7-8-19	5 plus		

This patient was improved clinically, with no improvement in his sight. He was seen too late for treatment to be of any benefit to his eye condition. Serologically he improved to some extent. We used mercurialized serum in this case because the patient had marked reaction after salvarsan.

With two exceptions, we have had no disagreeable complications in the treatment. In one case, the patient became delirious a few hours after the treatment and there was a transient paralysis of both lower extremities which cleared up entirely in one week. In another case of tic douloureux with symptoms for only six months jaundice developed after three treatments. With jaundice still present

he received another intraspinal treatment and died three days later, probably due to the overwhelming toxemia.

While we had a few cases in which we could see no improvement either clinically or serologically, we have had a few cases with brilliant results and definite results in a considerable number. We therefore feel that our results are better with the combined method of treatment, than we have been able to obtain with the intravenous method alone. Tabulated our results are as follows: Improved, twenty-seven, or sixty-four per cent.; unimproved, fourteen, or thirty-three per cent.; died, one, or three per cent.

I believe when properly performed intraspinal treatment is indicated as a routine in all cases of syphilis where clinical symptoms and examination of the spinal fluid indicate involvement of the central nervous system.

In conclusion, I wish to express my thanks to Dr. Nathaniel P. Rathbun and Dr. William F. McKenna for having permitted me to use the results of their private cases in compiling this report.

123 REID AVE.

SYPHILIS AS A CAUSE OF DELAYED HEALING IN THE NONINFECTED ABDOMINAL INCISION.*

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In 1914, Miles F. Porter discussed the question of delayed healing in the noninfected incision. He, however, confined his discussion exclusively to the epigastric region and sought to show the cause as due to the increased tension of the upper abdomen, or to the scantiness of the circulation in these tissues, or to nutritional disturbances of the nerve supply. There seems to be little or no literature on this subject, although nearly every surgeon of considerable experience has had one or more cases. Morris's article (1) is about the only reference to the subject. Morris thinks that the occurrence of delayed healing in the upper abdomen is due to trophic or neurovascular disturbance in the zone of Head.

Porter collected personal expressions from a number of surgeons. Some of these attributed the separation of the tissues to soiling of the incision with the contents of the upper bowel or stomach, inasmuch as most of the operations in the upper abdomen are performed on these organs. Others thought blood dyscrasia, malnutrition, and toxic conditions, such as advanced carcinoma, might be the cause; but Gerster significantly remarks that "back of all these there must lie biochemical causes as yet unknown to science." Madelung asks why the discussion of delayed healing should be confined to the upper abdomen, when eighty-two out of one hundred and fifty-six cases occurred in incisions below the umbilicus. Deaver sees no reason why

wounds anywhere in the abdomen should not heal, in the absence of infection.

None of these reasons seems to me to answer the question adequately. If it is due in the last analysis, as Bloodgood thinks, to catgut, why does not the same catgut used by the same surgeon in the same way not more often result in failure? As a matter of fact, these cases occur so infrequently that this can hardly be the reason. The same question may be asked if it is due to faulty technic or to infection, and yet busy surgeons of wide experience in each instance seem to be able to recall only a few cases.

Some have thought that the lack of union is most marked in, or wholly confined to, the deeper structures. The question may well be put: Why should a surgeon who has been constantly operating over a period of fifteen or twenty years in hundreds of cases, with a well developed and highly refined technic and employing methods of suturing which succeed and are expected to succeed in perfect incisions in practically all clean cases, suddenly be confronted with an incision which, when the sutures are removed at the usual time, opens to the bottom with no attempt at union of anything, not even the peritoneum, which ought to be sealed together in twenty-four hours, and with no evidence whatever of any infection? Why should it occur so rarely, if it is due to faulty technic, or catgut, or neurovascular disturbance, or lack of blood supply, or tension? Certainly these conditions occur so constantly that, if delayed healing is due to them, it ought to be as commonplace as the usual occurrences in abdominal incisions, such as stitch abscess, incisional hernia, and other conditions.

In my own experience, which covers an active service of nearly twenty years, I can find but three cases among hundreds of abdominal incisions. This comparative infrequency accords with the experience of most of those discussing the question, and also of those quoted by Porter. No surgeon seems to have had many cases, and yet almost all can point to a few. But if the few cases occurring in the practice of each of us could be collected and studied, the number in the aggregate would be sufficient from which to draw valuable conclusions.

Two of my cases occurred in patients with incisions below the umbilicus and one above. The first, a ward case, was that of a negress on whom I did a subtotal hysterectomy for large fibroids. The case was a perfectly clean one. There was no indication after the operation of any infection of the incision, either locally or constitutionally. We thought she was making a satisfactory recovery until the removal on the tenth day of the silkworm sutures from the skin. Then the whole wound fell wide open, peritoneum and all, so that one could look with unobstructed view to the bottom of Douglas's cul-de-sac. She became infected and died. This case occurred before the discovery of the Wassermann reaction, but the almost universal prevalence of syphilis among the Southern negroes at least places her under suspicion.

The second case occurred in 1913 in a husky Italian, on whom I did a cholecystostomy. The incision was made through the right rectus muscle. Five days after the operation the incision showed

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no healing and no infection, and the intestines were protruding. He was taken to the operating room, sewed up again, and fed actively on iodides, with the result that his incision healed perfectly. In his case the Wassermann reaction was positive.

The third instance occurred in a patient on whom I did a Wertheim operation for carcinoma of the cervix. The other two patients were strong and robust. This one was of lowered vitality, although the cancer had not progressed extensively. When the skin stitches were removed on the tenth day, the incision presented a straight line of apparently perfect union. There had been absolutely no evidence whatever of infection. A few hours afterward, however, it had all fallen apart, even the peritoneum. The Wassermann test was reported negative, but it was learned that she had conducted for years a number of houses of ill fame, in a series of cities. Her general facies and appearance with sunken nasal bridge and husky voice would have suggested specific disease if there were no such thing as a Wassermann, and there is no doubt in my mind of the presence of an old specific infection, in spite of the negative Wassermann.

These three cases are not enough for definite conclusions, but two were undoubtedly syphilitic and the other was probably so. This evidence is enough to suggest syphilis as one of the causes at least, of delayed healing in the abdominal incision. If by this report I may be able to stimulate the discussion of your individual experiences and to urge each surgeon who may have a few cases, to study them from the viewpoint of specific syphilitic infection and report the results, in a year or two enough data may be collated to enable us to conclude what part old syphilitic infection plays in the absolute lack of healing in incisions in which we had every reason to expect perfect results, primary union and better things.

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1704 PACIFIC AVENUE.

AN EARLY VIEW OF VENEREAL DISEASE

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The terrible prevalence of venereal diseases has been forced upon the attention of the Canadian government and a national council has been formed to assist the central and local governments in combating the evil. As president of this council I was led to examine again what some of the older authorities had to say about these diseases.

From a somewhat extensive collection of ancient medical literature in my library, I select as one of the most instructive and interesting a volume of 516 pages, licensed September 2, 1664, and published in London in the following year. The title of the work is *Medela Medicinæ, a Plea for the Free Profession and a Renovation of the Art of Physick*. The author is given as M. N., Med. Londinensis, the

motto *Medice cura teipsum*. It is known, however, that the author was Marchmont Nedham (or Needham), a versatile journalist (1).

Medela Medicinæ, healing of medicine, is an attack on the formal practice of the physicians of the time. It attacks the Methodists who strictly followed rule, Galenists who care not if a patient die so long as he has been treated *secundum artem* ("Let him die, if he will, so he die *secundum artem*." (2), like Balzac's physician of Mantua, who "did not only not particularly inquire into the cure of diseases but boasted that he had killed a man by the fairest method in the world." The writer urges experiment, the use of the microscope, inquiry of smiths, grooms, farriers, cattle breeders, barbers, midwives, nurses, old women, as to their remedies. Spurning as mere chimeras the old doctrine of four elements attributed to Hippocrates, of four qualities and four complexions fathered by Galen, and also Galen's real "allopathic" principle that "contraries are to be cured by contraries," he himself accepts Dr. Willis's five elements: water, earth, salt, sulphur and spirit (3).

Nedham does not so much find fault with the practice of Hippocrates—he savagely attacks Galen—as try to show that however useful the practice was in Hippocrates's country and time, it was not useful in England in the seventeenth century, and "in plain English a Doctor bred in the Contemplative Philosophy of the Schools may be a Scholar and a very fine Gentleman, but what is that to the Curing of a Disease or the rousing of a Heartsick Man from his bed of Languishment." As an example of a drug with medicinal qualities elsewhere, but not in England, he speaks of "Coffee which Prosper Alpinus (the last of the Methodists) in his book *De Medicina Ægyptorum* relates to have abundance of vertues in that Country of Egypt, of which we find no effect in England save that it serves to make a Liquor harmless enough in Rheumatick Bodies, for ordinary conversation like other Drink but not for any considerable peculiar uses of Medicine as in Egypt."

His main thesis is that diseases have been much changed and that they "are of another nature than they were in former times." The main causes of this alteration he states as being the French pox (4) and the scurvy. It is his account of the former disease which is of interest to us in this connection.

At its first appearance in the world, the French pox was very different from what it had become. Fracastorius (5) and Benivenius (6) tell us that "it in the beginning broke (7) forth in odious pustules of several kinds upon the privates, the head, the face, the neck, the breast, the arms and generally the whole body. Some also it disfigured after the rate of a leprosy; others had a kind of scurf, which scaling off discovered the skin underneath to be black or blue. Upon some, fowl ichorous sores were continually running. And besides all these they had in the inward parts great tormenting ulcerations, as in the mouth, the throat, the nostrils, the urinary and spermatic passages which did eat off the penis, the palate, the lips, the nose in despite of all medicines, so that men being affected with the disease, their friends were frightened from look-

ing upon them and spurned them as if they had been visited with the pestilence. These things being considered with the terrible pains that racked them it was rightly termed by a certain author *Miserabile scortatorum flagellum*."

But Fracastorius, who he observes was born before the introduction of syphilis into Europe, says that in twenty years it altered much and that there was after this another imitation within six years' time, the disease not raging as before in the external parts. This agrees with the account of Fernelius "who was born almost twenty years before it was discovered in Europe and lived to seventy-two years of age, saw it much changed in the space of thirty or forty years, in so much as he tells us in his time it was much altered, not defacing the bodies of men with pustules, scurfs, and virulent ulcers but tormenting them more with intolerable pains which though they might be increased by the ignorant and preposterous ways of curing them used, yet the disease itself also changed continually and seemed to decline and grow old—*adeo ut lues quæ nunc grassatur, vix illius generis esse putetur*" (8).

Two or three generations later Sennertus (9) observed that, whereas in earlier times nearly all if not all infections took place in coition, now "where one person gets this disease by the beastliness of venery, many hundreds have it by traduction," for he says, "The French disease is now become hereditary, being derived from parents to their posterity by generation and communicated from infected persons to others by kissing, by sucking, by clothes and the like."

Nedham points out that the venereal distempers contracted in either of these ways differ externally from that gotten by unlawful contact, for they (i. e., those contacts in any of the ways mentioned) "usually appear in the form of other maladies," for which he vouches not only eminent authors but also his own daily practice "as abundance of people grow sickly and languish under the appearance, it may be, of a consumption (10), a gout, a dropsy, an ague, a slow fever and sometimes an acute one, sore eyes, green sickness and indeed all manner of diseases, which when the other ordinary means have long been used in same, have at length been relieved by an orderly, i. e., systematic, use of antivenerous remedies." He says further: "This disease falls sometimes but gently on the hair, sometimes on the nerves and causes all manner of palsies, cramps, convulsions, toothache, pains in the limbs, gout of all sorts, lameness, general debility, etc.; sometimes on the bones, sometimes on the fleshy parts whence come leprosy, scurfs, ulcers, knotty swellings, and the like; sometimes on the brain, whence come sore eyes, rheums, catarrhs, epilepsies, etc.; sometimes on the lungs, whence come asthmas, coughs, phthisical consumptions, etc., and so many other diseases too long to enumerate." He warns "strikers" (11) of their great danger and says of "women strikers" that there is scarcely any possibility of escaping infection because they are the receivers of impurity. The very carefully prescribed precautions for the "male strikers" are given in the "decent obscurity of a learned language"—Latin. They consist of imme-

diately and thorough ablution preferably with hot water *post coitum*, for while "an internal taint (more or less) be scarce ever avoided by any, yet cleanliness *ex post facto* is a great means to prevent the virulent eruptions of a gonorrhœal exulceration and other sad effects in and about the genitals." Such measures may be quite ineffective *quo flagrantius libidine exardescunt et, equorum instar, igneo spermate stimulati rem ferocius affectant* (12).

One cause of the impossibility of preventing contagion is the supposed fact of contagion at a distance. This our author firmly believes, and quotes learned authors in support. Zacutus Lusitanus (13) says: "I have proved the French pox is contagious at a distance." Minadous (14) considered that he had also proved the same and thought that natural spirits might carry contagions from one to another. Avicenna (15) is authority for contagion at a distance in leprosy, Zacutus in leprosy, scabs, scurfs, itches, sore eyes, catarrhs, etc.; and our author submits that there is no reason why it should not be the case in French pox. He does not indeed accept the theory of Minadous that "natural spirits carry contagion"; he has two other media which he advances explaining them on scientific lines, as science was then understood. True "the ordinary gross conceit (conception) of the world concerning corporeity renders doctrines of this kind very difficult to comprehend; but he who reads the finer philosophy of this wiser age and does not take measure of it by the beards of our ancestors but has digested the principles of the magnetic or sympathetic doctrine of our noble Digby (16) and others treating of the subject . . . of the truth of which daily experiments are a sufficient testimony, will soon agree upon the probability, the certainty indeed, of persons being seizable at a distance by virtue of the continual effluxes of atomical corpuscles which one may call bodikins instead of bodies, whereby the grosser substances, usually termed bodies, are touchable by each other and hold communication with each other at remote distances and so operate upon each other by infection or qualification." The principles are plain and quite in accord with the science of the time. Every body struck by light has small atoms separated from its mass and then the light carries off these atoms, minute corpuscles, "bodikins," these flow with the light or without it, through the air at all times and in all directions and may be attracted by their like or may strike at random. Consequently, as "Fracastorius and Nicolaus Leonicensus" (17) two learned Italians do both contend that the French pox rambles . . . seizing folk that never had any carnal mixture with unclean persons." Fortunately perhaps the disease thus communicated is different in its effect from that caught by carnal intercourse—the latter is usually more visible in its dire effects upon the body by gonorrhœas, buboes, ulcers, etc., while the former "is of a finer nature and dives not so deep at once into the blood and humors (fluids) as it insinuates into the spirits and ferments of the body and acts by time and stratagem, lying still till it has an opportunity, not but that the other many times lurks some years also, but this more curious (18) way of contagion for the most part after it has made entry

proceeds leisurely and gradually to debauch (19) the whole habit of the body and seldom plays the tyrant till it has made a full and final usurpation which it seldom accomplishes without a revolution of many years. And then perhaps it appears not like itself but in the shape of some one or more diseases . . . So in this disease, the pox, may lurk, but the manner how with the reason why, we can only guess at." Sennertus is quoted with approval as saying that the lues passes under the name of many diseases, for the venom lurking in the body though it seems extinct will show itself after thirty years' time. "It will act all the diseases of the stomach, liver and spleen; it will appear in a headache, vertigo, falling sickness, catarrhs and distillations (20) of all sorts, strange arthritical pains, diseases of the lungs and of the womb, etc."

So much for mechanical effluvia. The author is more interesting when he speaks of another source of infection not unlike the former. It is the conception of the famous Jesuit Athanasius Kircher (21) of Fulda, then living at Rome, which Nedham approves. The "new paradox" (22) of Kircher was that contagion was conveyed "not only by the volatility of such effluvia, atoms and corpuscles as were inanimate but by such also as were animate, living creatures, and were a sort of invisible worms or vermicles which were visible only under the microscope. (Had he said bacilli, spirochetæ, or the like, he would have been modern.) Our author says that by the use of his microscope he discovered why sage unwashed is hurtful to those who eat it: for Nedham examined sage with his microscope and found what appeared to be animals exceedingly small on it—he gives a number of other experiments showing the marvel of the microscope and is perfectly satisfied that measles, smallpox, spotted fevers and purples (23) (purpura, petechial fever so-called) come from small worms or vermicles, and does not hesitate to say that much of the infection of the lues is due to these small animals, animalculæ. But more than the terminology is wanting to bring him up to our modern way of thought. He believed these small animals were flying all the time through the air retaining their vitality indefinitely, a conception contrary to our modern science.

As to the treatment and cure of venereal disease, he seems to give full credence to a superstition still prevalent, namely, that one recently infected may get rid of the disease by passing it along without delay to another of the opposite sex. He reprobates the practice indeed, but does not doubt its efficacy. "For at first taking the disease lodges in the out parts, viz., the urinary and spermatic vessels, and doubtless ought to be sent back the same way that it came in, as is evident by the immediate cure that some as soon as they have been clap't have procured to themselves by repeated coitions with sound women: and some I have known to glory in this villainy of debauching that sex in order to bring about a cure."

He has no patience with the do nothing physician and he rightly deprecates the neglect of an infected person "to look out for a cure" and has nothing but condemnation for the custom "to run to any pretender for a cure for pox . . . for the pretend-

ed cure very often proves worse than the disease destroying the constitution." Some physicians are no better "because they make use of the common scope and remedies in curing." He condemns the cheap-poor-whore-cure by fontanels or issues derived from the practice of the poorer Spaniards. Mercurial unguent may serve for "carriers and porters and other robustious bodies" but "setting upon every venereous patient with this dreadful remedy" is unpardonable. The resulting salivation with other dreadful symptoms following its use show that Nedham was speaking of the unguent treatment carried to excess. The mercurial cinnabar fume was yet worse and to those with pectoral troubles it was pernicious for "use what care you can, the mercurial air will get into the chest." Salivation by internal medicine was quite as bad as managed by most surgeons, although it was the best of all ordinary ways—but care should be used to "do the work of salivation without those tedious and intolerable afflictions of swollen head, loose teeth, sore and swollen mouth, tongue and throat, etc."

Keep away from receipt mongers, for the "common sort . . . err not only in their pretended way of curing the pox when it is inveterate and confirmed but they stumble and do as much mischief in the very beginning when it is but a clap (as they call it) a virulent running of the reins, etc." There must be due temperance and rule of eating, drinking, exercise and recreation; but when all is said and done mercurial salivation is the only cure.

I do not here follow the author in his remarks as to the treatment of scurvy and other diseases, or into his animadversions on physicians and their practice in general; these matters are not germane to the object of the present inquiry.

NOTES.

1.—Marchmont Nedham (or Needham) born 1620, educated at Oxford where he took his B.A. at the age of seventeen. He was afterwards an usher in Merchant Taylors' school, then an under clerk in Gray's Inn, of which he became a member in 1652. He also studied medicine, when, where and under whom does not appear. He found his true vocation in journalism. He was a supporter of Cromwell and his scurrility, vigor and boldness were not surpassed in any of the writings of the period. On the restoration of the Stuarts in 1660 he took refuge in Holland but soon obtained a pardon and returned to England. For the rest of his life (he died in 1678) he practised medicine with an occasional excursion into journalism.

My copy of the *Medela Medicinæ* is bound in contemporary calf, not tooled or gilded. It seems to have at one time belonged to a Dr. Mudd (not the Dr. Mudd who looked after Wilkes Booth's fractured fibula and paid so dear for his humanity). Some previous owner had made a memorandum on the page opposite the title page, "There is an answer made to this book by Dr. Spraddin," referring to Dr. Robert Spracklin's *Medela Ignorantiæ*, 1666. There were two other answers, one by Dr. John Twysden, *Medicina Veterum vindicata*, 1666, and the other by Dr. George Castle in *Reflections on a Book called Medela Medicinæ*; printed with *The*

Chymical Galenist in 1667. Nedham himself says, "Four champions were employed by the College of Physicians to write against the book," and adds that two died shortly afterward, the third took to drink and the fourth asked his pardon publicly. See D. N. B., Vol. XL, Pp. 159-164: Athenæ Oxon. Vol. iii, 1187.

2.—This reminds one of the skit on the well known Dr. Lettsom, who flourished in London toward the end of the eighteenth and the beginning of the nineteenth century. One very usual form runs:

"When patients sick to me apply
I physics, bleeds, and sweats 'em;
If after that they please to die,
What's that to me?" I. LETTSOM.

3.—Dr. Thomas Willis (1621-1676), M.A., Oxford 1642: M.B. 1646: M.D. 1660: F.R.S., F.R.C.P. 1664. He was the first to distinguish diabetes mellitus and was physician in ordinary to King Charles II.

4.—Nedham calls this disease by many names—pox, French pest, French disease, French ferment, French pox, pocky disease, pocky lues, pocky ferment, pocky infection, lues venerea, lues, French lues, French infection, venereal disease, venereal distemper, never syphilis. Gonorrhœa is mentioned but, of course, it was then supposed that gonorrhœa was a form of pox, an error which was later confirmed by Dr. John Hunter's classic experiment on himself and which gave way only after the investigations of Ricord and his school. Neisser, of Breslau, placed the specific identity of gonorrhœa beyond question in 1879 by his discovery of the gonococcus: but it was not till 1905 that Schaudinn and Hoffman identified the *Spirochæta pallida* of syphilis.

5.—Girolamo Fracastoro (latinized Fracastorius) 1483-1553 of Verona, physician to Pope Paul III: he revised the old theory of "critical days" and rather gave it a new lease of life. It was in full vigor in England in Nedham's time and is attacked by him. Fracastorius, among many other works, medical and poetical, wrote a book on *Contagious Diseases* but is best known by his famous poem *Syphilidis sine Morbi Gallici libri tres*, Verona, 1530, often reprinted and translated into French and Italian. (The Latin form is very rare, I have seen only one copy.) The hero of the poem was a swineherd, Syphilus, i. e., the swine lover (without apparently any implication of unnatural vice, although that form of crime has been not infrequently suggested as the original of syphilis) and his sufferings from the *Morbus Gallicus* were the theme of the poem. The Italians charged the French with being the originators of the infection, whence *Morbus Gallicus*, while the French not to be behind in international courtesy gave the honor to the Italians, whence *Mal de Naples*. The almost universal use of the term syphilis seems to be largely due to Sauvages—Francois Boissier de la Croix de Sauvages (1706-1767) the animistic mechanician who made a system of diseases on the lines of Linnæus' System of Botany in his *Nosologia Methodica*. Sauvages makes ten classes of diseases, 295 genera, and 2,400 species. (Linnæus had 325 genera of plants).

6.—Antonio Benivieni (ob. circ. 1502), of Flor-

ence, a Hippocratic of a somewhat rigid school. He is of some note as an obstetrician and pathologist.

7.—I modernize the spelling, capitalization, punctuation, etc.—archaisms in these are apt to draw the attention away from the substance. There could not be said to be a standard English orthography until Dr. Samuel Johnson's time, every one following his own judgment, taste or caprice and not infrequently two or more spellings of the same word would be found by the same author in the same book, the same paragraph, sometimes in the same sentence. Capitalization did not become thoroughly standardized until well into the nineteenth century—often the nouns were written with a capital as is the custom still in German; other important words were often capitalized while adjectives generally received a small letter as in French.

8.—Jean Francois Fernel (Fernelius) was born in 1497 by which time syphilis had been recognized in parts of Europe. The celebrated siege of Naples by Charles VIII of France which was the cause or at least the occasion of spreading the infection took place in 1495. But Nedham gives his age at death as seventy-two; Fernel died in 1558, therefore Nedham must have thought that he was born *circ.* 1486, and indeed 1485 is given as his birth year by some authorities, e. g., Bass in his *History of Medicine*. Fernel was a great mathematician but turned his full attention to medicine at the age of thirty-five; he was the most distinguished physiologist of his age but thought the blood originated in the liver and the "elements" were actual bodies. Nedham quotes from Fernel's *De Lue Venerea* and part of his work *De abditis rerum causis*. The Latin with which the quotation ends means: "So much so that the lues which now prevails can hardly be considered of the same kind."

9.—Daniel Sennert (Sennertus) 1572-1637, the son of a shoemaker in Breslau, studied at Wittemberg where he received his degree in medicine, Leipzig, Jena, Frankfort and Berlin. He became a professor in Wittemberg and introduced the study of chemistry in that university. He died there of the plague in 1637. He was one of the first to describe scarlet fever (1619); he was an "atomist" and held that each element had primary particles, corpuscles or atoms peculiar to itself. His works are in six large folio volumes, the last edition published at Lyons in 1696; the quotation is from Book VI, part IV, chapter 5.

10.—It must be borne in mind that consumption until very recently had a wide connotation. See Note 7 to my article in the NEW YORK MEDICAL JOURNAL of September 27, 1919, on Medical Theory and Practice of an 18th Century Doctor of Divinity. Nedham himself speaks of three species, hectic, phthisic, atrophic.

11.—This word is no doubt akin to the German Streicher; while it was not in very common literary use before and at Nedham's time it had been used by Nash and some others. The New English Dictionary, p. 1136 *sub voc.* Striker 2 d quotes this very book *Medela Medicinæ* for its use. The word is synonymous with *scortator* or what Nedham bluntly calls whoremonger. A woman striker is the female of the species.

12.—“Where they are too passionately inflamed with desire and, like horses, urged on by burning semen attempt their aim too fiercely.” The precautions to be taken are given in Latin “locked up from the eyes of common readers partly for modesty’s sake and partly because such cautions may prove an encouragement to wickedness.” The reasons for avoiding all reference to such diseases and prophylactics against them are only now beginning to yield to terrible necessity. Zacutus Lusitanus (Abraham Zacuto), 1575-1672, a learned Portuguese Jew born in Lisbon, an ardent follower of Galen and the Arabians and a pathologist of some merit, is quoted for preventive rules but even Zacutus admits their failure in some cases.

13.—See Note 12. The works of Zacutus cited are his *Praxis admiranda*, Book II, obs. 134; and *De Medicinæ Principalium Historiæ* 73.

14.—Thomas or Aurelius Minadous, 1554-1604, a celebrated practitioner and professor at Padua, one of Harvey’s preceptors—the work of Minadous cited is *De Lue Venerea*, Chap. V.

15.—Avicenna (Ebu Sina, Abu Aliebu Abdallah ebu Sina) 980-1037, “the Prince of Physicians,” too well known to require further notice here.

16.—As to Sir Kenelm Digby and his powder of sympathy see my article in the NEW YORK MEDICAL JOURNAL for February 19, 1916.

17.—Nicholas Leoniceus (1478-1524) was the first to write on anything like modern lines on syphilis (1497); he was well acquainted with the symptoms and many of the effects of the disease which he considered infectious and epidemic: he did not believe in the American origin of the disease but thought it had existed in antiquity. He was a fine classical scholar and occupied with lustre the chair of medicine at Ferrara. He was largely responsible for the reinstatement of Hippocrates and the loss of influence of Pliny.

18.—“Curious” in the seventeenth century had certain meanings now rare or obsolete; it means here ingenious, clever.

19.—“Debauched the whole habit of body”—“debauched” was a new word in English at that time, having been imported from France about 1600—the French *débaucher*—it meant corrupt or pervert: “habit of the body” was the same as our late “diathesis,” *valde defendus*.

20.—“Distillations” are fluids forming in minute drops from any tissue—not distinguishable from catarrhs except that the catarrh is rather flowing and *en masse*, the distillation stationary and minute.

21.—Athanasius Kircher, (latinized Kircheus), 1601-1680, entered the Jesuit order at the age of seventeen; he became almost an Admirable Crichton. He lectured at the University of Wurzburg on philosophy, mathematics, Hebrew and Syriac, afterward he taught mathematics and Hebrew at Rome, where he died. He was one of the first to study the hieroglyphics of Egypt. It is his work *De Peste* which Nedham makes use of; it was written in 1658 and afterward printed at Leipsic with a preface by John Christian Lange.

22.—“Paradox” in the proper and etymological sense of an opinion opposed to that commonly held. cf. De Morgan’s *Budget of Paradoxes*.

23.—Nedham says that Drs. Lange and August Hauptman even before Kircher’s investigations were troubled over “that terrible disease, the purples, which so frequently befalls women within the month after childbearing” and laid their heads together to determine the cause. They found under the microscope petty vermicles spread upon the whole superficies of the characteristically rough skin and concluded them to be the cause. It is perhaps better not to know things than to know things that are not so.

24.—We know that Lange ascribed syphilis to microscopic worms and Hauptman to small insects—a mere difference in terminology.

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DISORDERS OF FUNCTION OF THE URINARY BLADDER.*

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The function of the urinary bladder is to act as a reservoir for the urine received from the renal ducts and to retain it until discharged through the urethra. After the completed act of urination the bladder under normal conditions is empty, its walls being retracted to their full extent. As urine flows in from the kidneys the walls gradually relax to accommodate the fluid, so that the internal pressure remains at a constant level. The extent to which the walls can relax depends on the individual bladder and whether its walls are healthy or in a state of disease. At any time, however, if the attention of the brain is called to the bladder a feeling or desire to evacuate the bladder may be induced, which desire also can be set aside by will if the attention is diverted from the bladder, but at last a condition is reached when the bladder walls have relaxed to their fullest extent and then they begin to undergo slight tonic contractions. If the call is neglected long hypogastric pain is felt, continuous and spasmodic, and finally the desire to micturate becomes uncontrollable.

The call to micturate under normal conditions is largely a matter of habit. The normal bladder can be trained to retain urine for many hours or it can be made to fall into bad habits through nervousness and ability to gratify the desire readily and often. Various foods and drinks have a profound influence. Urine of a high density containing much pigment and uric acid in suspension can often be held for hours, whereas urine of low density may have to be passed every hour or oftener.

The muscles of the bladder consist of two sets: The detrusor set, consisting of longitudinally and circularly disposed smooth muscle fibres, and a sphincter set, consisting of the muscles of the trigone and circularly disposed smooth muscles at the entry of the prostatic urethra. The muscles are under voluntary control to a certain extent, that is to say, the whole complex act of micturition can be started or stopped by means of voluntary impulses descending from the brain but beyond a certain limit the brain ceases to be able to control them

*Read before the Buffalo Academy of Medicine, April 7, 1920.

and micturition becomes involuntary and forced. The compressor urethra is a voluntary muscle which can be used as a sphincter of the bladder and in addition there is a set of voluntary muscles which can be made to empty the bladder by increasing the general abdominal pressure, namely, the muscles of the belly wall and the diaphragm.

The involuntary muscles of the bladder are supplied by two sets of nerves: sympathetic fibres from the hypogastric plexus which run out from the cord along the lumbar nerves; sympathetic fibres from the sacral plexus which run out along the second and third sacral nerves forming the nerve erigentes. Stimulation of the hypogastric nerve endings produces inhibition and relaxation of the detrusor fibres and contraction of the sphincter fibres. Stimulation of the nerve erigentes produces inhibition and relaxation of the sphincter and contraction of the detrusor.

During the act of micturition the sphincter is relaxed and the detrusor contracts. The act can be stopped, however, voluntarily by contraction of the compressor urethra till the inhibitory impulses to the involuntary muscles have time to act, or urination may be stopped by disease of the coordinating nervous mechanism.

The following disorders of the bladder will be briefly discussed: Inflammations, tumors, vesical calculi, atony, hypertrophy, and nervous disorders.

INFLAMMATION OF THE BLADDER.

The inflammations of the bladder may be reduced to a small number of clinical types, though each of these types has many variations. Authorities differ so widely in their classifications of cystitis that an accepted classification can hardly be said to exist. The following simple classification, however, will suffice to illustrate: 1, Nonbacterial cystitis, a, traumatic, b, chemical; 2, simple bacterial cystitis which may be acute or chronic, acid or alkaline; 3, tuberculous cystitis.

Traumatic cystitis.—A mild cystitis or irritability of the bladder as it is often called may be caused by the passage of a highly concentrated urine containing phosphates, urates and oxalates. This is characterized by more or less frequency of urination and distress. The so-called gouty or rheumatic cystitis is of this type.

Chemical cystitis.—Any strong irritant entering the healthy bladder whether from the kidneys or through the urethra may cause a cystitis. Rehm and Lichtenstein (4) have called attention to marked vesical tenesmus occurring in coal tar workers, apparently due to inhalation of irritating vapors. While hyperacid urine is irritating to the bladder, ammoniacal urine is far more so, and the reason why an alkaline cystitis is likely to be so much more intense may be due to the fact that the ammonia adds fuel to the fire of bacterial attack. Cystitis may equally be caused by irritants introduced through the urethra. Nitrate of silver is so often used in a concentrated solution that it bears an unenviable notoriety in this regard.

Simple bacterial cystitis.—This is the disease that is generally spoken of as cystitis.

Acute bacterial cystitis.—This is characterized by a sharp congestion most marked around the trigone

and the neck, or it may be entirely confined to that region. The mucous membrane is swollen and bright red in color. The capillaries are dilated, the epithelial cells swollen. Later the epithelial cells begin to desquamate. Then the angry crimson of the mucous membrane is blotched by petechiæ, its gloss is lost and here and there minute vesicles or abscesses may appear. After these break, small ulcers remain. If the acute condition persists the muscular and peritoneal coat become inflamed.

Chronic bacterial cystitis.—The mucous membrane is irregularly thickened and dense. Its surface may be red or gray in color, while here and there may be seen areas of ulceration or granulation.

Frequency of urination is the constant symptom of cystitis except in mild cases or where there is retention or suppression of urine. It is a fair index of the severity of the inflammation. In mild cases the patient may urinate every three hours or so during the day and empty his bladder only once or twice during the night. On the other hand, a patient suffering from acute cystitis may urinate with great frequency during the day and night, the calls to urinate occurring every ten to fifteen minutes and if they are not obeyed they result in the expulsion of the contents of the bladder no matter how much the patient may strain to retain the bladder contents. Frequency of urination, however, is by no means pathognomonic of cystitis, it may be purely neurotic or may be due to prostatitis, hypertrophy of the prostate, vesical calculi or other causes.

Vesical pain in cystitis is due as a rule to the presence of urine in the bladder. If there is no retention the pain is intermittent. If there is retention the pain is constant. It is most severe at the time of urination. In mild cases it may only be felt at that time. It is felt chiefly in the glans penis and the perineum though it may radiate along the under surface of the penis up the rectum to the hypogastrium, groin, hip, testicle or loin. When the inflammation is marked there is often a continuous ache in the perineum, the hypogastrium or the hip, while in dysuria there may also be an irritating spasm of the bladder and its sphincter as the last drops of urine are passed. The patient straining after the bladder is empty markedly adds to the irritation already present.

Although patients suffering from cystitis often exhibit such symptoms as chills, fever, sleeplessness, anorexia and loss of weight and strength, these symptoms are not necessarily directly referable to inflammation of the bladder, but may be due to inflammation of the prostate gland or to involvement of the kidneys, or may be the result of the distressing symptoms of pain, dysuria and tenesmus.

Chronic cystitis is so common that there are few diseases of the lower urinary passages of which it does not form a part of the picture. Chronic cystitis rarely commences as an acute disease but is chronic from the start. Once started it does not tend to get well spontaneously but slowly and steadily becomes worse. Fortunately its causes are well known and most of them easy of demon-

stration. Many of them can be removed and with them the chronic inflammation which they keep up. Some cases are incurable on account of permanent structural alterations that have taken place in the bladder walls or because the cause cannot be reached. All, however, may be benefited by careful study and judicious management in the hands of a skilled urologist.

Tuberculosis of the bladder.—The characteristic irritability of the bladder, the frequency of urination and the pain accompanying the act is often the earliest and always the most distressing symptoms of tuberculosis. At first the frequency of urination is not so great although there may be marked discomfort, as soon as a few ounces of urine have collected in the bladder, and the pain is chiefly confined to the end of urination. As the bladder contracts down on the last drops of urine a terminal hematuria may appear and a sharp pain may be felt in the perineum and often on the under surface of the penis at the penoscrotal angle. The effect of this pain is to excite a tighter spasm of the bladder and the result of this spasm is an increase in the pain so that a good deal of pain and spasm persist after the last drops of urine have been voided. This will leave a soreness which may not pass off before another urinary act renews the distressing cycle. At first this pain is only fairly constant but later accompanies every act of urination.

As the disease progresses ulcers are formed or mixed infection occurs, then another pain may be felt, a pain before urinating, characterized by an irresistible urgency, which if not immediately gratified may result in a spurt of a few drops of urine down the sufferer's thigh in spite of all his efforts to prevent it. The urine of tuberculous cystitis is acid. At first it may be clear or bloody. Later it is bloody and often foul with products of suppurative cystitis. But however foul and ammoniacal it may be, its one striking characteristic is its continued acidity. However, it is not impossible for the urine of a mixed infection to be alkaline when passed as a result of the predominance of pyogenic cocci. The most important part of the urinary examination in this type of cystitis is the search for and finding of the tubercle bacillus.

TUMORS.

The majority of the tumors of the bladder are of epithelial origin. The tumors generally begin as benign papillomatous growths but soon undergo carcinomatous degeneration. Next in frequency come the connective tissue growths fibroma, myxoma, sarcoma and the mixed tumors. No more is known about the pathogenesis of tumors of the bladder than about tumors occurring elsewhere. In the report of ninety-nine cases of bladder cancer collected by Nason, seventy-eight occurred in men. From this we are led to believe that the condition is met with at least twice and perhaps three times as often in men as women. Tumors may occur at any age, but the majority of carcinomata occur in the decades between thirty and sixty.

The first, the last and often the only symptom of a tumor of the bladder is hematuria. As a rule the more villous the tumor the more profuse the

bleeding. The characteristic hemorrhage of a neoplasm begins without apparent cause or warning, may last for several days, be copious and painless, unaffected by rest, diet or medication, and cease as suddenly as it began without any apparent reason. Its cessation may leave the urine entirely normal and the patient is lulled into a false sense of security by what he considers his narrow escape from a perilous condition. A profuse hemorrhage of this type is almost pathognomonic of neoplasm. Though it may assume any form the hemorrhage usually grows more severe and recurs more frequently as the disease progresses.

Of all the instrumental manipulations employed in the diagnosis of tumors of the bladder, cystoscopy stands first, for it alone indicates the presence, the nature, as far as can be determined, the location and the number of tumors.

VESICAL CALCULI.

Single calculi are generally rounded or ovoidal in shape. Multiple calculi are usually phosphatic, less frequently uratic. In general their number bears an inverse relation to their size. There are no symptoms absolutely and invariably pathognomonic of stone in the bladder, yet there is a certain group of symptoms which are very suggestive of stone. Chief among these are frequency of urination, pain and hematuria, occurring by day and increased by exercise. The pollakiuria and dysuria of stone are usually intensely marked and appear early in the disease. The pains are situated chiefly in the glans penis along the pendulous urethra and in the perineum. The characteristic distress is absent during the night or when the patient lies quietly on his back. Many different ways have been suggested to prove the existence of stone in the bladder. Among these the cystoscope and x ray are the most popular today.

ATONY OF THE BLADDER.

Loss of bladder power may be due to disease of the muscle fibres themselves rather than the nerve supply. A state of atonic relaxation may be produced which is so complete that there is passive distention of the bladder with continual passive overflow or it may be incomplete, the muscle fibres being unable to retract to their full extent.

Atony of the muscle fibres is produced by the following causes: 1. Mechanical overdistention, a, after a single acute unrelieved retention, b, insidious onset from chronic back pressure. 2. Poisons acting on the muscle itself, a, acute specific fevers, especially typhoid and influenza, b, chronic cystitis (diffuse fibroses of the wall). 3. Poisons acting on the nerve supply and the muscle, belladonna and morphine.

It used to be held that if the muscle of the bladder became atonic no recovery of tone would take place. From observations of the end results of prostatectomy it is becoming increasingly clear that recovery of tone can be expected and may even be complete if the cause is removed, especially if caused by urethral obstruction. Drugs such as nuxvomica are useful adjuvants, and the muscle can also be exercised by applications of the triphasic electric current to the hypogastric.

Hypertrophy of the bladder is the result of an

obstacle to the free flow of urine through the urethra. The commonest causes of obstruction are enlargement of the prostate gland and stricture of the urethra. It may however be caused by severe prolonged inflammation with but little obstruction (vesical stone or vesical tuberculosis). There are no special symptoms of vesical hypertrophy except frequency of urination. The treatment of hypertrophy of the bladder is the removal of obstructive and inflammatory causes.

NERVOUS DISORDERS.

One of the first and often the first sign of tabes is a bladder that functions badly. A tabetic bladder crisis generally begins suddenly towards the end of micturition. As the last drops of urine are squeezed out an intense cramping pain is felt in the urethra and at the end of the penis. The pain passes off in a few minutes but in a short time the desire to urinate returns and the attack is then repeated. The intervals between attacks may vary from a few minutes to hours or days. The pain usually is so intense as to cause the patient to double up and cry out. These pains presumably take origin in the degenerating neurons and as degeneration becomes complete the pains pass away and do not return. The patient then passes into the stage of painless paralysis. These crises, however, are rather the exception than the rule in tabetic cases and the patient may have little or no pain from the onset.

In the early stages the coordination of the act of urination is interfered with, the sphincter hesitates to relax as the detrusor contracts so that sudden interruption of the stream occurs or the urine drips away slowly. In a later stage there is a partial retention of urine with increased frequency of micturition. The detrusor becoming relatively insufficient, the bladder is neither full nor ever completely empty, a residual urine varying from six to twelve ounces may be removed by a catheter. This stage gradually passes into one of complete retention with overflow and incontinence but as the sphincter is relaxed the mere act of coughing or any slight straining movement may produce a dribble of urine. In considering diagnosis the nature of the nerve lesion must be determined and suitable treatment applied, especially if there is a syphilitic taint and the exact condition of the bladder should be investigated by means of the cystoscope.

This paper is presented in the hope that a better cooperation may be arrived at between the general practitioner and the urologist in diagnosing and treating lesions of the genitourinary tract.

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Acute Endaortitis with Formation of Two Aneurysms and Rupture of the Aorta.—F. Merke (*Schweizerische medizinische Wochenschrift*, February 12, 1920) reports the case of a man fifty-one years old, suffering from chronic cystitis, in whom an aortitis developed. This was followed by the formation of two aneurysms of the aorta and final rupture. The aortitis was ascribed to a bacteriemia arising from the urinary passages.

THE WASSERMANN REACTION.

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The subject of Wassermann's reaction is still under discussion and in the remarks which are to follow I shall borrow freely from the work done by Golay and others at the syphilographic clinic of the University of Geneva, based on some four thousand five hundred reactions. Negative in all subjects free from syphilis, Wassermann's reaction must necessarily become positive after infection since, without exception, every person with florid specific secondary lesions as yet untreated will give a positive reaction.

The date of the appearance of the reaction, after the onset of the initial sclerosis, varies with different observers and with the subjects, as Golay has been able to show, since he has had cases of chancre positive on the fifth day after its appearance and others negative as late as the thirty-second day, but after this time the results have been invariably positive. Consequently it sometimes happens that in some cases recent syphilitic chancres give a positive reaction while in others the chancre may have undergone cicatrization and the Wassermann still remain negative, which explains the varying percentage of positive results obtained by different observers during the primary phase of the infection:

Levaditi, Laroche, Yamanouchi.....	46 per cent.	
Wassermann, Citron, Blaschko, Brulius...88 to 91 per cent.		
Gaston and Mauriac.....	79 to 81 per cent.	
Ejowsky ..	} Clinic of Geneva.....	
Pribilsky. }		69 per cent.
Golay.... }		70 per cent.
		76 per cent.

Statistics, to be sure, are of only relative importance because they comprise reactions made at periods more or less distant from the date of the infection. The same statistics made three days after the first appearance of the chancre should give one hundred per cent. negative results, according to Golay's researches, and if done on the thirteenth day in all untreated cases of syphilis, they should give one hundred per cent. positive results. What is still more interesting and useful from the viewpoint of practice is to establish the average date of the appearance of Wassermann's reaction. Evidently it must be positive when, the infection having become generalized, it can be detected in the blood. The septi-cemia, as Gaucher has shown, always precedes the secondary lesions, so that if we take the appearance of the chancre as a starting point, by combining the figures given by different observers, we can place it at about the fifteenth to the twentieth day. By following his patients in series and making a daily examination—the only proper method to follow—Gaucher noted that the reaction became positive in the average case on the fifteenth to the twentieth day. Here are some figures:

Jadassohn (Berne).....	fifteenth to twenty-fifth day.
Oltramare (Geneva).....	fifteenth to twentieth day.
Audry (Paris).....	twenty-fifth day.
Finger (Vienna).....	} twenty-first day.
Wassermann (Berlin).....	
Troisfontaines	twenty-fifth to thirty-fifth day.

It would appear the more sensitive the antigen, the earlier will the reaction be positive, and in point of fact, Desmoulières, using his reinforced antigen,

found that the mean date of appearance of the reaction was between the eleventh and the thirteenth day. Contrary to what has been maintained by others, it would seem to result from this fact that the antibodies do not appear suddenly in the blood, but are produced little by little, and can be detected only at the moment that their quantity corresponds to the sensitiveness of the antigen. As Joltrain and others have pointed out, the septicemia develops earlier following chancres of the lips than of the genital organs.

From these figures it results clinically that so long as a chancre has not fifteen, or even in some rare cases thirty-two days' existence, the seroreaction may not agree with the diagnosis; hence the conclusion that the clinical signs of chancre, the incubation period, the local lesion, adenopathy and above all the presence of the spirochetes, have a far more considerable importance than Wassermann's reaction. On the other hand, the latter may render real help in cases where cicatrization of the chancre has already taken place or is undergoing repair, in which it is no longer possible to find the spirochete nor decide upon its nature until the secondary lesions develop. A distinctly positive reaction will settle the question and intensive treatment be instituted at once.

The seroreaction during the period of chancre, however, will be of interest if it can be proved, as some observers maintain, that abortion of the infection is easier to obtain with the arsenical products while the seroreaction is still negative. Yet in spite of a large number of cases Golay and others of the Geneva school are not prepared to offer a positive opinion in this respect.

All untreated cases of secondary syphilis will give a positive reaction. Nevertheless, from the viewpoint of the diagnosis, the reaction has not at this time a primordial value, since the nature of the lesions, the still visible cicatrix of the initial sore, the inguinal adenopathy, etc., will, in the vast majority of cases, make the diagnosis only too evident. A Wassermann reaction will then only confirm the nature of the disease, but from the viewpoint of the clinical value of the Wassermann reaction a positive result will, on the contrary, be of great importance, since it proves that all syphilitics, unless they have received energetic treatment during the primary phase, have had at a given time a positive Wassermann. At this time also, the reaction has another scientific and clinical point of interest. I refer to those cases where the differential diagnosis between chancreform syphilides and reinfection is doubtful. A positive reaction before the fifth day following the appearance of the chancre is positive proof that the lesion is merely a recurrence and not a new infection.

The percentage of one hundred afterward decreases as time goes on, with the disappearance of the lesions and especially with treatment, which, perhaps, explains the sixty, seventy, eighty per cent. positive results in secondary syphilis obtained by some observers, and frequently comprising all categories of patients, treated or untreated, with or without lesions. In this respect Mauriac has given statistics of the results obtained by

the Wassermann in untreated cases of syphilis as eighty-eight per cent. and fifty-four and one half per cent. in treated cases, but he does not state if in these cases the patients had or did not have lesions present. On the contrary, Ledermann, in his statistics, classified the results in positive Wassermann reactions in secondary syphilis with symptoms as ninety-eight and one tenth per cent. and sixty two and one half per cent. in latent cases, but he does not refer to the question of treatment.

By classifying the cases of secondary syphilis into syphilis with lesions and syphilis without lesions (latent), Golay presents the following results:

Secondary syphilis with lesions, untreated.....	100 per cent.
Secondary syphilis with lesions, treated or untreated	89 per cent.
Secondary syphilis with lesions treated.....	79 per cent.
Secondary syphilis without lesions, treated....	47 per cent.

It will be noted that in the table given above untreated secondary syphilis without lesions does not appear, which would have been highly interesting, inasmuch as it would fix our opinion of the state of the reaction in patients left to their own devices. But these cases which unquestionably exist can only be detected indirectly, when lesions develop a long time after infection, for the simple reason that a subject, who believes himself to be in perfect health and without any specific lesions, will naturally not consult a syphilologist. However, Golay has found that syphilitics who have had little or bad treatment usually present a positive reaction for a long time and he has found that syphilitics of thirty or thirty-five years' standing, subjected to more or less treatment, but who nevertheless had never presented manifest lesions and enjoyed excellent health, presented very positive Wassermann reactions.

These data would seem to confirm the opinion of a large number of syphilographers that clinically, syphilis left to itself will never be recovered from and that although it leaves the patient with remissions of thirty, forty or more years, the presence of a positive seroreaction proves the existence of latent foci at any time ready to become active. Cases of general paresis with a negative Wassermann, far from invalidating this fact, prove that the foci may undergo their evolution in a closed area, so to speak, without influencing the composition of the blood.

During tertiary syphilis, the Wassermann would at first sight seem to offer no rules whatever. For example, it may happen that a subject with a tertiary lesion, whose clinical diagnosis leaves no doubt, may nevertheless give a negative reaction, even when little or no treatment has been followed in the past. But it is probable that such instances are rare, since several conditions may explain this situation, namely, the effect of former treatment or the localization of the process in the central nervous system. In the latter case the reaction is often negative, while Gaucher, Paris and Sabaréanu, studying the seroreaction in twenty cases of incompletely treated tertiary syphilis, obtained four negative results; in three, the central nervous system was involved, while the fourth presented no lesion.

On the other hand it may happen and this is by far more frequent, that a very positive Wassermann coincides with a syphilis which has been latent for

many years and all these data which surprise us and are most confusing may nevertheless find their explanation. If one is dealing with the paradoxical case of an active syphilis with a negative Wassermann and the syphilis is mild, it may be admitted that the treponemæ being localized in one or several foci have lost their activity and do not secrete sufficient toxin for the tissues to react by the manufacture of antibodies, or perhaps that these antibodies, for unknown reasons, are destroyed as fast as they are produced. If the syphilis is severe, it must then be admitted that the organism is too weakened to react by producing antibodies. The same phenomenon is met with in tuberculosis, because, generally speaking, a mild tuberculosis reacts much better to tuberculin than a rapidly progressing caseous tuberculosis.

If, on the other hand, one is dealing with yet another paradoxical condition but of an inverse order, that of syphilis without lesions but with a positive Wassermann, two contingencies may take place theoretically: either the lesions exist but are unnoticed by both patient and physician, or they do not exist and it may be admitted that the spirochetes secrete toxins and produce antibodies by *contrecoup*, without producing any lesion. But now if factors, often badly understood, come into play lesions develop consequent upon the awakening and the pullulation of the treponema which had been until then well tolerated by the subject.

The transformation of a positive into a negative reaction by treatment is explained by the complete or partial destruction of the parasite. The secretion of toxins is then arrested or greatly eliminated, the tissues no longer react or react insufficiently for the antibodies produced to be detected by the seroreaction. An interesting fact has been demonstrated by Iversen and brought to light by Milian, who has even derived from it a very interesting diagnostic and therapeutic proof, namely, that before disappearing the reaction passes through a maximum which coincides with the bacterial lysis. At this moment destruction of the parasites is massive and the toxins they contain are then liberated in the blood in great quantity. This fact can also be compared with what takes place in tuberculosis where, according to Gougerot and Troisier, the microbe dies in a state of solubility and may be more toxic than the living bacillus.

A statistical study of Wassermann's reaction in the tertiary phase of syphilis undertaken by several syphilographers has given quite constant results. Joltrain found from eighty per cent. to ninety per cent. positive reaction; Bruch and Stern, in a total of 378 cases, found it positive in 57.4 per cent.; Bering, in a total of 391 cases, found it positive in 82.2 per cent. and Bayet seventy per cent. These slight variations from one observer to another are to be explained by the fact that they did not take into consideration when making their statistics, either the treatment or the activity, or on the other hand, the latency of the syphilis presented by their patients. In order to obtain a distinct idea of the question the cases should be divided into four classes: 1, patients with tertiary syphilis in activity and not treated; 2, patients with tertiary syphilis in activity

and treated; 3, patients with tertiary syphilis in latency and not treated; 4, patients with tertiary syphilis in latency and treated.

In practice such a classification is impossible, as classes one and three would be wanting. Today, patients coming without having been treated during the secondary period are becoming more and more rare, so that in the present circumstances we must be content with two categories, first, tertiary syphilis with lesions, and secondly, tertiary syphilis without lesions. In parasyphilitic affections, the Wassermann reaction gives quite as high a percentage, if not higher, of positive results of tertiary syphilis. But in these cases, as in those of cerebral and medullary lesions of luetic origin, the examination of the cerebrospinal fluid should always be done at the same time. Their combined study will be of immense help and when the Wassermann is negative the cerebrospinal fluid will be positive, especially when gross meningeal lesions exist.

All observers have noted the fact that the reaction of the cerebrospinal fluid may be positive while that of the blood is negative. Jacobsthal says that is especially true of recently developed parasyphilitic processes, but that later on in the evolution of the process the blood will also give a positive reaction. Therefore, in order to detect general paresis or locomotor ataxia at their very onset a Wassermann and a cerebrospinal test are of utmost importance. Here are some of the results obtained with the cerebrospinal fluid:

Levediti and Marie, positive results.....	80	per cent.
Beaussart, positive results in tabes and general paresis	90	per cent.
César, positive results in tabes and general paresis	78	per cent.
Lesser, positive results in general paresis....	100	per cent.
Lesser, positive results in tabes.....	96	per cent.
Mauriac, positive results in general paresis...	80	per cent.
Ledermann, positive results in general paresis	96.9	per cent.
Ledermann, positive results in tabes.....	76.4	per cent.

For such striking results comment is unnecessary. In hereditary syphilis Wassermann's reaction is no less important and its results are no less encouraging than in other luetic manifestations and may be compared to those obtained in the acquired form of the infection. Demanche and Detre state that in early hereditary syphilis and during its evolution positive results are obtained in 87.5 per cent. of the cases; Mulzer and Michaelis, in ninety-five per cent.; Bauer in 100 per cent. and Bertin and Gayet in ninety-eight per cent., but in late hereditary syphilis the percentage of positive reaction is very much less. Knoepfelmacher and Lehndorff are likewise of this opinion. The two last named observers state that the Wassermann is invariably positive when the hereditary syphilitic infant presents cutaneous lesions, otherwise the reaction is often negative, becoming positive only when lesions appear. It then remains after treatment for many years, regardless of the absence of any lesion. On the other hand, Paris and Desmoulière have shown that in hereditary syphilis the reaction at first positive, later on becomes negative, even when the patient is untreated, an opinion based on a very large number of cases, and what goes to show that the hereditary form has a tendency to cure, even without treatment, is that these subjects may contract syphilis late in life.

Editorial Notes and Comments

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THE SCARLET FEVER MYSTERY.

The war has assisted in unravelling some of the tangled skeins of disease, although perhaps none of these has been completely unravelled. Some light has been thrown on cerebrospinal fever and possibly on that form of pneumonia generally known as septic pneumonia. Instructive light is thrown on infectious diseases in England and Wales by the second report of the Ministry of Health on the Incidence of Notifiable Infectious Diseases in each Sanitary District of England and Wales During the Year 1919. Especially is this the case so far as scarlet fever is concerned. The figures show that as soon as the war began the rate of incidence of this disease went down until in 1917 it reached 1.44 to the thousand population. The same rate stood in 1918, but in 1919 it went up to 2.23 a thousand. In 1914 it stood at 4.38 a thousand. Moreover, the death rate from the disease in 1917 and 1918 was described in the Registrar General's return as the lowest recorded in England and Wales; the mortality being trifling compared with that prevalent a generation earlier.

While the scarlet fever rate dwindled during the war, the rate for cerebrospinal fever increased by leaps and bounds. The figures for cerebrospinal disease rushed up from 0.01 to 0.08 a thousand in 1915 and remained high up until 1918, when there was a sharp fall. Why then when scarlet fever was going down, was cerebrospinal fever rushing-up? Dr. Hamer, the Medical Officer of Health for London, believes that there is a connection between scarlet fever and fleas. The war, by moving the population from

place to place and cleaning a portion of it not usually cleaned, may have cut down the flea population. Dr. Hamer reports fewer beds flea marked in common lodging houses during the war period. This view has not been substantiated, but, at any rate, the hypothesis is a plausible one and it is more than likely that increased cleanliness may have reduced the number of fleas throughout England and Wales. Moreover, this suggestion is in accord with the opinions of some observers who hold that a considerable number of the infectious diseases are to a certain extent insect borne. Typhus has been definitely proved to be spread in this manner.

Another remarkable feature of the report with respect to scarlet fever is that while the scarlet fever rate to the thousand persons was 2.23 for England during 1919, it was 60.98 for the country district of King's Lynn in Norfolk and 20.36 for the town of King's Lynn. It is true that these districts have a small population, which detracts greatly from their statistical value, yet the disproportion of the figures, to the rest of England, is so large that it would seem that Dr. Hamer's suggestion might be put to a practical test either in King's Lynn or in any other place where an unusual rate is found. It would seem after all that John Wesley's saying that "Cleanliness is next to godliness" is very near the truth and one to be highly commended as a health axiom. It has been denied that there is any inherent sanitary virtue in cleanliness and that after all it is but more or less an esthetic luxury. However, where dirt is there vermin flourish, and if vermin are carriers of disease, as they have been proved to be in the case of plague and typhus, and as they may be and probably are in scarlet fever and other infectious diseases, then the sanitary motto should be, let cleanliness and especially personal cleanliness prevail.

HEREDITARY TRANSMISSION OF SYPHILIS.

George Vella was the first to conceive the idea of the hereditary transmission of syphilis in 1508. After him came Jacob de Béthencourt in 1526, then Frascator, Massa, Feruel and Fallopius in the sixteenth century and Sylvaticus, in 1601. All these observers mention the hereditary transmission of the *mal français*, but they only seem to have encountered cases in which the manifestations of the infection appeared shortly after birth. Uçay, in 1699, first suspected that congenital syphilis might occur for the first time in late childhood or even in adolescence and he does not hesitate to say that "it

is from syphilis that so many hereditary diseases are derived, such as scrofulous tumors, old (chronic) ulcers, gouts and rheumatisms as well as the whites in women." Later writers on syphilis soon went astray in the matter of congenital syphilis, so that in 1736, the learned Astruc, although not admitting the transmission of syphilis by heredity in the strict sense of the meaning, believed that several very different affections, such as rickets or tuberculosis, were derived from what he termed degenerated syphilis.

Sanchez, Fabre, I. L. Petit, Rosen von Rosenstein and other writers of the eighteenth century went still further and attributed all sorts of disease—even alopecia areata—to hereditary syphilis. Toward the end of this century congenital lues dominated both in surgical and medical pathology with the exception of traumatic surgical affections. In these circumstances a reaction was bound to occur, so that Hunter refused to admit the transformations of hereditary syphilis, but he was wrong when he denied the possibility of the transmission of the infection from parent to offspring. Bell, in 1793, maintained that this transmission did exist and he even added that it might remain latent for some years. Then in 1828, Lagneau gave an excellent description of congenital syphilis, while Cullevier and Ration, in 1836, regarded the late manifestations as due to scrofula. Baumes, of Lyons, maintained in 1840 that congenital syphilis manifested itself, "sometimes while the child is in the uterus of the mother, at others at the time of birth, of a few months, a year, or several years after."

Thirteen years later, Ricord upheld his doctrine of tardy heredity before the Academy of Medicine of Paris, and in 1862 illustrious syphilologists declared that "late hereditary manifestations, not preceded by early accidents, must be regarded as an acquired fact," and since that time all writers on the subject have described two forms of hereditary syphilis; an early form with manifestations at birth or in early childhood and a late form arising in late childhood, at puberty or even later. Little attention has been given to the nervous manifestations of hereditary syphilis, although in 1712, Hoffmann said that he had cured a nervous affection by mercury in a young girl nine years old "of illustrious birth and whose father had been infected with a pox as thoroughly as one could be." At about the same epoch Beckers, Joseph Pleuck (1779) and Rosen von Rosenstein mention similar cases, while in 1783 Carrère attributed certain types of paralysis, epilepsy and apoplexy to hereditary syphilis. It was, however, only in the second half of the last century that hereditary cerebral syphilis commenced to be seri-

ously studied and although some well observed cases were reported before 1868, this year is memorable from the fact that Hughlings Jackson's paper appeared, *Cases of Diseases of the Nervous System in Patients Subjects of Inherited Syphilis*, which marked the beginning of our present knowledge of syphilis of the nervous system in subjects with hereditary syphilis.

PHYSICIAN-AUTHORS—DR. JOHN ARBUTHNOT.

There are many authoritative students of letters who contend that the clearest and most virile mind of all the wits of Queen Anne's reign was that of Dr. John Arbuthnot. To attribute to a man a brilliancy and depth of learning beyond that of Swift, Pope, Addison, Congreve, Gay, Atterbury and Parnell is indeed a tribute. Thackeray admired Arbuthnot above all his contemporaries and Samuel Johnson said: "I think Arbuthnot the first man among them." For that matter, the contemporaries themselves conceded his intellectual superiority and gracefully acknowledged many a debt to him. Why, then, is he not better known at present? Why is he now almost totally unknown and his writings practically unread? There are two main reasons. First, he has not survived in general literature because of the ephemeral nature of the topics he chose to write about. To appreciate his writings it is necessary to have a fairly complete knowledge of the period in which he dwelt. Second, Arbuthnot preferred to be a man of medicine. He had a complete lack of literary ambition and was contented to assist his contemporaries toward literary fame rather than to compete with them. He was lavish in his assistance of Pope, Swift and Gay. They were his intimate friends and got ideas and inspiration directly from him. Others got ideas and inspiration from him through his writings. Thus Dr. Arbuthnot may be said to owe his fame today to what he did not write rather than to what he wrote.

There are two satires by which Dr. Arbuthnot is chiefly remembered today. These are his famous *History of John Bull* and *The Memoirs of the Extraordinary Life, Works, and Discourses of Martinus Scriblerus*. The first of these, written in 1712, follows the structure of Swift's *Tale of a Tub* and is fully its equal in merit. It was an ingenuous and lively attack on the war policy of the Whigs and it achieved results. As an allegory of statecraft it remains without a rival and was the model of all political satires in England for a century or more after its appearance. But it was a satire of passing men and events and not built for lasting popularity. The most

enduring part of it has been its title. The appellation *John Bull* was originated by Dr. Arbuthnot and it has clung to the British nation ever since. So, too, has his description of John Bull. The John Bull of the cartoonists today is John Bull as Dr. Arbuthnot described him.

The *Scriblerus Memoirs* ranks as one of the finest pieces of sarcastic humor in the language. It was from this work that Sterne appropriated the bulk of his material for the earlier chapters of *Tristram Shandy* and the same source gave Swift his inspiration for *Gulliver's Travels* and Pope the inspiration for his *Dunciad*. "If the world had but a dozen Arbuthnots in it," said Swift, "I would burn my *Travels*." Pope in his *Epistle to Dr. Arbuthnot*, which forms the prologue to his satires, pays further generous tribute to his learned friend. The *Scriblerus Memoirs* were first printed in some of Pope's works. They were the outgrowth of the Scriblerus club which Arbuthnot, Swift, Pope and others of the Queen Anne galaxy organized in London. The so-called memoirs were to have consisted of several books satirizing the abuses of learning, and several members of the club were to have collaborated in the writing of them. Only the first book, by Arbuthnot, was completed.

Other writings of Arbuthnot included *Virgilius Restauratus*, in which he gave us Virgil corrected and improved in a playful vein; *The Art of Political Lying*, which would seem not to have permanently corrected this evil; a monograph entitled *An Argument for Divine Providence*, essays *On the Usefulness of Mathematical Learning*, and a considerable number of other essays on subjects of current interest.

Dr. Arbuthnot was born at Arbuthnot, Kincardineshire, Scotland, in 1667. He attended the University College at Oxford from 1694 to 1696 and took his medical degree later at St. Andrew's University, Aberdeen. He established himself in medical practice in London, but patients were few and far between and he supplemented his income by teaching mathematics. He found time, also, to compile a comparative table of Greek, Roman and Jewish measures, to translate from the Dutch *The Laws of Chance, or a Method of Calculating the Hazards of the Game*, and to do a little writing. His fame as a wit and man of learning was growing but his medical practice was not. Then came a stroke of good fortune. Prince George of Denmark, husband of Queen Anne, fell ill at Epsom and Dr. Arbuthnot happened to be there at the time. No other physician being immediately accessible, he was called in, and became the prince's physician during the rest of his life. Shortly thereafter, in 1705, he also became physician extraordinary to the queen. His

medical reputation was established and distinguished patients flocked to him by the dozens. In 1723 he became one of the censors of the Royal College of Physicians and in 1727 he delivered the Harveian oration, the supreme medical honor of the day.

Pope said of Dr. Arbuthnot that "He was as good a doctor as any man for one that is ill and a better doctor for one that is well." His principal medical writings were *An Essay Concerning the Nature of Ailments*, in which he argued, among other things, that all that is done by medicine might be equally well done by diet, and *An Essay Concerning the Effect of Air on Human Bodies*. Sir Benjamin Richardson called this second work "one of the most remarkable books in the literature of medicine" and pointed out that Arbuthnot was far in advance of his age in medical science and made some remarkable discoveries. Dr. Arbuthnot died in 1735 at the age of sixty-eight.

PROGRESS IN PSYCHIATRY.

An unusually fascinating records of events is presented in Professor Kraepelin's [Prof. Emil Kraepelin: *Hundert Jahre Psychiatrie, Ein Beitrag zur Geschichte menschlicher Gesitung, Arbeiten aus der Deutschen Forschungsanstalt für Psychiatrie in München*, Vol. I, Berlin, Julius Springer, 1920.] paper, which introduces the recently published first report of the new German institute for research in psychiatry. The slow development of scientific interest in this important field is told in such manner that one is compelled to acknowledge the magic of evolutionary growth which not even the thick prejudices of selfdefending ignorance are able to stem. Progress forces its way, however it is temporarily halted by such barriers, however its force is partially dissipated in half fruitless experiments at understanding mental disease. It lies in the essence of human nature that it casts strong defenses about itself in its timidity toward what is still unknown, that it hinders just that work into which it is drawn by its own instincts.

So it has come about that in the realm which belongs to psychiatry, that of mental disease, timidity and ignorance supporting one another have made the road into intelligently humane treatment of the insane a long, hard one. For understanding is in its very nature fellow feeling, and therefore to admit that one understands mental disease implies participation in experience with the sick. The mind is afraid of such acknowledgment and strongly on its guard against it. Thus, feeling at least maintains an ignorance of mental disease as long as is possible and, as must be admitted, long after science has professed enlightenment of these darksome matters.

It is not strange that even a few decades ago the mentally diseased were shoved aside from a calm businesslike approach to their problems and were relegated to the forcible confinement of cells and chains; or their agonies of mind and absurdities of behavior were the work of the devil or of evil propensities on their own part which must be ejected by the severest discipline. It is difficult even today to acknowledge that a neighbor's differing conduct or his opinion that varies from an established code can deserve a considerate approach which might at least lead to understanding and perhaps acceptance. One can still preserve one's own accustomed attitude so much more comfortably by putting him in chains or submitting him to exorcising tortures. For these in themselves set the stamp of disapproval and therefore release from further responsible effort.

All these considerations, not intellectually but rather intuitively adhered to, hindered but could not permanently retard the gradual introduction into psychiatry of real investigation into the state of the mentally sick and the possibility of elements of humanity still residing beneath the sufferers' apparent strangeness. So with experiment in many directions, with an attitude of sympathetic approach of one sort and another a way was gradually made into the darkness.

The granting of freedom of body to those once shackled was at the same time justified by the slow discovery that there was a certain freedom and elasticity of the mind in which access to the sick person could be attained. Possibility of healing still remained. The varied attempts made under such awakening human interest foreshadowed the varieties of approach which today maintain an even surer hold upon medical thought. They arose then out of the principle of unity which lay in the nature of mind and body with their close interrelationship, they ground themselves today even more deeply in such foundation. They tend in it to a simpler basis of understanding. Yet from this they again branch into ever widening territories in which mental disease must be variously studied.

To such broadening end Kraepelin's review of psychiatry leads. To fruitful attack upon the problems of mental disease in these various spheres he points with hopeful inspiration. Looking backward or looking forward, his words are such as to enlist the reader's interest. It is to be regretted that he has not disclosed more deeply the fruitful psychical field which can lay claim to no less importance than the anatomical and in which he might have said much more of the profounder implication of psychic factors in mental disturbances.

THE TORONTO CANCER CURE.

When the medical profession has before it many well authenticated cases of epitheliomatous cancers (of two or three months' rapid growth), cured by radium in six weeks or two months, then they begin to wonder why Dr. T. J. Glover, Toronto, withholds even a progress report on his serum treatment of cancer, which, during the past two or three months, has received such wide publicity in the lay press of both Canada and the United States. Many hundred cases have been treated in St. Michael's Hospital, Toronto, but within the past month, a millionaire's mansion has been purchased for Dr. Glover, and his patients are said to run at the present time into the hundreds. The newspaper press has been supplying the profession of some details of the work but so far not a single case of cure has been reported.

The medical press in Toronto are now calling the attention of Dr. Glover to this very unusual, if not unethical, way of bringing a cure for cancer before the medical profession; and some nasty remarks have been made even in the newspaper press about the intention of Dr. Glover keeping his cure secret for the benefit of his own personal gain. So far as the profession in Toronto is concerned, they would like to have some pronouncement from Dr. Glover either in the scientific press of Canada, England, or the United States; or perhaps better before the local medical body—the Academy of Medicine. Cancer is such a terrible disease, so hopeless of cure, that the profession would be very glad and proud of the facts if a real cure emanated from Toronto; but in the plainest English they hope that there is now sufficient data available to warrant Dr. Glover giving it to the profession in the regular way for benefit of mankind at large.

OVERWORK A STIMULANT.

The up to date factory physician and inspector are wide awake in their researches into sleep and fatigue. If employees could be massed together as to needful rest all would be easy, but the constitution and endurance of every man vary. It is noted by Spaeth (*Industrial Management*, 1920) that with most, normal fatigue is usually relieved by sleep and food; in some, it quickly goes on to cumulative fatigue, the precursor of nervous breakdown. Curiously, recent observations have shown that production actually increases with fatigue within certain limits; feverish haste and a dislike of not finishing up are not infrequent even when the work is not congenial.

ORANGEADE.

"Made from fresh oranges," so the vendor at the stall says; but the Bureau of Chemistry at Washington, D. C., otherwise labels it. The drink is usually made from sweetened, artificially, carbonated water colored with a dye to imitate orange juice and flavored with a little oil from orange peel. While not containing ingredients injurious to the health of adults, they are imitations and the young do not get the medicinal or food value of fruit juice. Such drinks do not come under the Food and Drugs Act.

News Items.

French Speaking Physicians Meet.—French speaking physicians of North America held their sixth congress September 9th to 11th at Quebec, under the presidency of Dr. Arthur Rousseau.

Southern Medical Association.—The Southern Medical Association will meet November 15th to 18th in Louisville, Ky., under the presidency of Dr. E. H. Cary, of Dallas, Tex.

Louisiana Lepers' Home Sold.—The Louisiana leprosarium at Carrville, La., has been sold to the Federal Government for use as a national leprosarium. The institution and the lepers who are inmates will be taken over by the U. S. Public Health Service.

Infantile Paralysis.—Figures given out by the Health Department indicate that there have been sixty-five cases in this city since January 1st and thirty-eight in the last month. Sixteen cases were reported in one week in the latter part of September. There have been six deaths in two weeks.

Southwestern Medical Association.—The Southwestern Medical Association, which comprises the states of Missouri, Kansas, Oklahoma, Arkansas and Texas, will hold its fifteenth annual meeting November 22nd to 24th at Wichita, Kan., under the presidency of Dr. E. E. Day, of Arkansas City, Kans.

Consultation Clinics in Massachusetts.—The Massachusetts State Department of Public Health has announced its plan of holding a series of consultation clinics in early pulmonary tuberculosis, to be conducted by the medical staff of the state sanatoria. Patients will be referred to the clinics by the family physician.

Hospital Fund Drive.—The United Hospital Fund, comprising forty-six Manhattan and eight Brooklyn nonmunicipal hospitals, will endeavor to raise a fund of \$1,500,000 beginning November 15th. This sum will represent approximately half the expense incurred in giving free treatment to those who are unable to pay.

Chair in Bronchoscopy and Esophagoscopy.—The Graduate School of Medicine of the University of Pennsylvania has established the first medical chair in bronchoscopy and esophagoscopy, the incumbent being Dr. Chevalier Jackson, of Philadelphia. Dr. Jackson will also continue his work at Jefferson Medical College, where he is professor of laryngology.

Attend Medical Congress.—A number of medical men sailed on September 30th on the *Mauretania* to attend the International Congress on the Classification of the Causes of Death, in Paris. The congress has been called by the French Government and will last ten days. Dr. Haven Emerson, former health commissioner, representing the Public Health Association; Dr. F. J. Monaghan, assistant health commissioner, and Dr. W. H. Guilfoyle, director of the Bureau of Vital Statistics of the Health Department, who represent the City of the New York; Dr. Otto Eichel of the Bureau of Vital Statistics of the State Department of Health, Dr. W. H. Davis of the United States Bureau of Census in Washington were passengers.

Miners' Hospital.—A \$200,000 hospital for the exclusive use of coal miners is to be erected in Charleston, W. Va., by District No. 17, United Mine Workers of America.

Quarantine Mexican Tourists.—Because of the prevalence of yellow fever in the seacoast cities of Mexico, the U. S. Public Health Service has placed quarantine restrictions against all travelers from those ports.

Sir Arthur Newsholme Returns.—Sir Arthur Newsholme, resident lecturer on Public Health Administration at the School of Hygiene and Public Health, Johns Hopkins University, has returned to Baltimore after having spent the summer at his home in England.

The Harvey Lectures.—Dr. Jacques Loeb, of the Rockefeller Institute for Medical Research, will deliver the first of the Harvey Society Lectures at the New York Academy of Medicine, Saturday evening, October 16, 1920. His subject will be The Proteins and Colloidal Chemistry.

Tuberculous Soldiers Ordered from Saranac Lake.—Tuberculous ex-service men who are being cared for by the government at the Home Sanatorium, Saranac Lake, N. Y., have been ordered transferred to New Haven and other government hospitals by October 15th.

Women in Virginia Medical Faculty.—The Medical College of Virginia, in Richmond, which last year opened its doors for the first time to women students, now has its first woman professor, Dr. Margaret Morris Hoskins, associate professor of anatomy. Dr. Hoskins was formerly at the University of Minnesota.

Vienna Doctors Strike.—A press dispatch from Vienna states that about four thousand doctors who have been treating patients under the auspices of sick benefit associations have gone on strike, and have refused to make visits except for the regular fees of their private practice.

Intoxication Increasing.—The number of arrests for intoxication in New York city is increasing, according to a statement issued by Chief City Magistrate William McAdoo. The figures for the first six months of 1920, from January to April, give the total number for the Greater City as 571. During April, May and June these figures rose to 1,396, approximating those of the first part of 1919. Violence which follows intoxication shows that the liquor in many instances must be of high alcoholic strength.

Change of Address.—Dr. Wolff Freudenthal announces the removal of his office from 59 East Seventy-fifth Street to 24 West Eighty-eighth Street, New York.

Dr. Maurice Packard announces his removal to 17 West Seventieth Street, New York.

Dr. Byron C. Clark announces the removal of his office to 163 West Ninety-second Street, New York.

Dr. Robert Abrahams has removed his office to 260 West Seventy-second Street, New York.

Dr. Abr. L. Wolbarst announces his removal from 113 East Nineteenth Street, to 792 Lexington Avenue, New York.

Dr. Jacob Rosenbloom announces his removal to 120 West Seventieth Street, New York.

Baltimore Charity Hospitals Raise Rates.—Baltimore hospitals which contract for the care of city patients have notified the municipality that they will not renew the contracts at the old rate of one dollar a day. They ask three dollars a day for each patient cared for in the future. The hospitals include the Maryland General, Franklin Square and St. Agnes.

State Hospital for Ex-Service Men—An appropriation of \$3,000,000 has been made by the New York State Legislature for the establishment of a state hospital for discharged soldiers, sailors, and marines suffering from mental diseases. The hospital will be built in the Borough of Queens, on land acquired for the Long Island State Hospital, and will have a capacity of 1,000 beds.

Ambulance Drivers Lacking.—Bellevue Hospital is experiencing a shortage of ambulance drivers, and for the first time since the establishment of Bellevue Hospital in 1736 the working hours of ambulance drivers have had to be changed. It was announced that the drivers will work twenty-four hours on and twenty-four hours off, instead of a six day week with the seventh day off as heretofore.

Hospital Bequests.—Under the will of Max J. Breitenbach, of New York, the following bequests are made to charitable and educational institutions: New York College of Pharmacy, \$25,000; Sanitarium for Hebrew Children of the City of New York, \$5,000; Montefiore Home, \$5,000; Beth Israel Hospital, \$5,000; Lebanon Hospital, \$5,000; Jewish Maternity Hospital, \$5,000; Crippled Children's East Side Free School, \$5,000; Mount Sinai Hospital, \$3,000; Hospital at Albany, Ga., \$1,000.

The will of Jacob H. Schiff, which has recently been made public, contains many bequests to charitable institutions. The Montefiore Home and Hospital for Chronic Diseases, of which the testator was for many years president, receives \$300,000. Other bequests were: Solomon and Betty Loeb Memorial Home for Convalescents, \$25,000; New York Association for the Blind, \$10,000; Babies Hospital in the City of New York, \$5,000; Tuberculosis Preventorium for Children at Farmingdale, N. J., \$5,000.

A gift of \$50,000 has been made to the Ware Visiting Nurse and Hospital Association, Ware, Mass., by the late Lewis N. H. Gilbert, of that place.

Local Medical Societies.—The following local medical societies will meet during the coming week:

MONDAY, October 11th.—Society of Medical Jurisprudence, New York Ophthalmological Society, Yorkville Medical Society, Association of Alumni of St. Mary's Hospital (Brooklyn), Williamsburg Medical Society.

TUESDAY, October 12th.—New York Academy of Medicine (Section in Neurology and Psychiatry), Manhattan Dermatological Society, New York Obstetrical Society, Clinical Society of the Hospital and Dispensary for Deformities and Joint Diseases.

WEDNESDAY, October 13th.—Medical Society of the Borough of the Bronx, New York Pathological Society, New York Surgical Society, Alumni Association of Norwegian Hospital, Brooklyn Medical Association.

THURSDAY, October 14th.—New York Academy of Medicine (Section in Pediatrics), West End Clinical Society, Brooklyn Pathological Society.

FRIDAY, October 15th.—New York Academy of Medicine (Section in Orthopedic Surgery), Clinical Society of the New York Postgraduate Medical School and Hospital, New York Microscopical Society, Brooklyn Medical Society.

Health Department Budget.—Dr. Royal S. Copeland, health commissioner, has asked for an appropriation of \$8,821,027.23 to run the New York City Department of Health for 1921, against \$4,758,951 for 1920. Of this amount \$7,551,978 is to run the department and the difference is for new buildings. One of the new activities for which the Commissioner is asking an annual salary list of \$11,600 is the establishment of a Bureau of Public Health Intelligence. Dr. Copeland said that for two years the department had been asking for a new official to watch the trend of disease in this city and throughout the world, in order to apply advance information for the safeguarding of New York against invasion by disease. The director of this bureau is to receive \$5,000 a year.

Dr. Copeland has asked for an allowance that would enable him to engage thirty inspectors of food at \$1,769 each, sixty-eight nurses for maternity work, nine dentists at \$1,244 each, nine nurses at \$1,800 each, and 18 dental hygienists at \$960 each.

It is the Commissioner's desire to increase facilities for making the Schick test for diphtheria. He estimated the needs of the department for this work as six medical inspectors at \$1,464 each a year, six nurses at \$1,800 each, and five laboratory helpers at \$840 each. He asked also for \$2,550 for a bacteriological diagnostician and a sum to allow for increasing the force of laboratory assistants and helpers. The department is asking that supervising nurses receive a salary of \$1,980 a year and field nurses \$1,800 a year. To do this \$46,217 will be required.

Died.

BOSHER.—In Richmond, Va., on Sunday, September 12th, Dr. Lewis Crenshaw Boshier, aged sixty years.

BURCH.—In Long Lake, N. Y., on Wednesday, September 22nd, Dr. Elmer D. Burch, aged fifty-three years.

COLE.—In New York, N. Y., on Saturday, September 25th, Dr. John D. Cole, aged sixty-three years.

HARRISON.—In Roanoke, Va., on Wednesday, September 1st, Dr. Henry William Harrison, aged seventy-one years.

HILL.—In Nanticoke, Pa., on Sunday, September 26th, Dr. Jacob Franklin Hill, aged sixty-four years.

JAMES.—In New York, N. Y., on Wednesday, September 29th, Dr. Howard James, aged fifty-five years.

JOHNSON.—In Los Angeles, Cal., on Friday, September 17th, Dr. Walter Sydney Johnson, aged forty-nine years.

KEAN.—In Manchester, N. H., on Thursday, September 23rd, Dr. M. E. Kean.

KOONS.—In Waynesboro, Pa., on Wednesday, September 29th, Dr. John H. Koons, aged sixty-six years.

MORGAN.—In Rolling Bay, Wash., on Monday, September 20th, Dr. William P. Morgan, aged seventy-four years.

ROBERTS.—In New York, N. Y., on Monday, September 27th, Dr. Charles Forrester Roberts, aged seventy-eight years.

STERLING.—In Philadelphia, Pa., on Friday, September 24th, Dr. Joseph Marshall Sterling, aged thirty-one years.

THOMAS.—In Wilmington, N. C., on Sunday, September 5th, Dr. George Gillette Thomas, aged seventy-seven years.

UPSON.—In Bristol, Conn., on Tuesday, September 21st, Dr. Charles Ransom Upson, aged sixty-eight years.

WOOLF.—In New York, N. Y., on Sunday, September 26th, Dr. Edgar Morton Woolf, aged thirty-two years.

Book Reviews

NEW VIEWS ON GOITRE.

Exophthalmic Goitre and Its Nonsurgical Treatment. By ISRAEL BRAM, M. D., Instructor in Clinical Medicine, Jefferson Medical College, Philadelphia, etc. St. Louis: C. V. Mosby Company, 1920. Pp. ix-438.

Readers of the *NEW YORK MEDICAL JOURNAL* will welcome Dr. Bram's book on the nonsurgical treatment of exophthalmic goitre. Much that is in the book has appeared in the *JOURNAL*. As the book stands today it is the most thorough exposition of Graves's disease to be found. When the risk attending surgical removal of the thyroid is considered and when we realize the splendid results that have been obtained by nonsurgical treatment, it is absolutely necessary to study the disease from the nonsurgical viewpoint. It is not to be thought that nonsurgical means only medicinal. The nonsurgical treatment embraces many methods of treatment, local, general and psychotherapeutic, and Bram has gone into the subject thoroughly, attacking it from every angle. He first studied the patient and the patient's life in an endeavor to trace the real etiology of the disease; he is not misled by the surface findings nor does he accept the apparent causative factors of the disease.

Following this, he endeavors to ascertain the value of every form of treatment, giving due credit to each one. He shows that the manifestations of goitre may be symptoms having many underlying causes. They may be the defense reaction of one leading a lonely home life; they may be fear reactions caused by the outcropping of the latent unknown content of the patient's unconscious. He shows the importance of the endocrine chain and how easily the equilibrium of the chain is upset. This knowledge is made use of in a diagnostic way when endocrine diagnostic tests, like the pituitary test, are utilized. It is also of primary importance in the treatment of the disease. While the study of practical endocrinology is in its infancy, we are now beginning to use much of the knowledge that has been acquired in the laboratory, linking it up with our clinical finding, and applying these findings in a therapeutic way. The results have been most encouraging and in many cases startling.

The use of the x ray has also found favor among many and in the hands of skilled operators has proved far more efficacious than the ordinary surgical procedures. Radium also has frequently given excellent results. Bram has given us a host of remedial measures and in many cases one remedy may prove to be excellent where another may fail. Some observers maintain that they have had a number of positive cures with every one of the therapeutic methods they have employed as their favorite one. Yet it cannot be said in looking over the entire list that any one of these can be called a specific for the cure of thyroid disease. There must be something more behind all this. The answer is given when we search for the etiology of the disease. Bram helps us materially when he stresses the underlying psychic factors and shows how they are universally responsible for setting the responsive mechanism of a susceptible patient into operation and thereby

causing the chain of symptoms, either separately or to the completion of the entire clinical picture known as Graves's disease or true exophthalmic goitre. Therefore, it is safe to assume that much of the good that has come from the many measures mentioned by Bram has come through the rapport established between the patient and the physician; a condition technically known as transference.

The patient, feeling inadequate within himself, a martyr, unburdens himself to the physician. In many instances this alone will tend to improve the patient's condition. The more thoroughly this rapport is established, the more interest the physician takes in the intimate life of the patient, the more will the benefit of this procedure be found. Naturally the patient must reveal, as far as he is able, the things that trouble him. Frequently it is impossible for the patient to know what the underlying difficulty is, for it will be buried deeply in his unconscious. Bram shows that it is most important to ascertain the patient's habits, tendencies, petty obsessions, and vices. In speaking of this Bram quotes Weir Mitchell, who said that "The cases of breakdown and nervous disaster, and the consequent emotional disturbances and their bitter fruit are oftener to be sought in the remote past. He may dislike the quest but he cannot avoid it. * * * The moral world of the sick bed explains in a measure some of the things that are strange in daily life, and the man who does not know sick women does not know women." Confidence must be secured. Once this is done rapid strides will be made. Sympathy must be extended and the patient must know that the physician is interested in the welfare of the patient. Then the patient must be reeducated and be taught to stand on his own feet, take an independent place in the world, and be made selfreliant.

Frequently the patient's friends and relatives, those of a talkative trend, have a bad influence upon him. They may in some cases be the cause of the patient's condition. All that must be ascertained and the objectionable surroundings removed, e. g., the talkative friends. The patient's general hygiene must not be neglected. There must be regularity of bathing, sleep, rest, exercise, feeding; in fact, the general condition of the patient must receive careful attention. One of the important issues emphasized by Bram is the sexual life of the patient. He shows how powerful a factor this may become under certain conditions. Sexual instruction must be given, after the sexual cravings and sex life of the patient have been determined.

This leads us to the social environment of the patient. In treating a patient we seldom inquire into this part of their lives. We know, and Bram realizes it, that the patient's household may be an inferno seething with suppressed antagonisms and hatreds. A patient's condition cannot readily improve under these circumstances and all the medication and surgical intervention known to medical science will not get at the bottom of the difficulty. The only advantage of a radical surgical operation is secured by the removal of the patient, for the

time being, from the unfavorable surroundings to the hospital.

Bram's book is replete with just such useful information. We realize that a busy surgeon, or general practitioner, for that matter, will not, as a rule, go into all of the details of the patient's life as he should in handling a delicate situation. He will be more likely to attempt a more perfect technic for the operation. However, we are coming more and more to realize that the high psychic levels of the patient are important—most important. Nevertheless, it is essential that some basis of therapy, similar to that mapped out by Bram, should be attempted before surgical measures are used. In most instances surgery will not be required. Even the surgeon would do wisely to ascertain what can be done outside his own field in the treatment of Graves's disease. In consideration of the importance of the subject and the careful handling it has received in this book it may be considered as one of the most important additions to medical literature of the present day.

ALTITUDE AND HEALTH.

Altitude and Health. (The Chadwick Lectures.) By F. F. ROGET, a Privat-Docent Professor in the University of Geneva. New York: E. P. Dutton & Co. Pp. xii-186.

The heights by great men reached and kept
Were not attained by sudden flight,
But they, while their companions slept,
Were toiling upwards in the night.

And while we were ignorantly huddled in the plains, and maligning cold air, Professor Roget and dozens like him, were frantically waving to us from the heights to follow on. But we shut our windows tighter and feebly shouted that we had a cold on our chest. "Nonsense," called out the mountaineers, "it's on your mind." But we created and filled a few more cemeteries before learning that they were right. We have learned that the immune countries are the coldest. That phthisis is accelerated where the average shade temperature is very high, and reaches its maximum of frequency in those regions of the temperate European zone which are only moderately cold, whether low lying or not. A few ventured up and were improved, but there is probably a precise altitude which is the best individually, and to that side deep attention is being given. Men go up there worn with toil or illness. "They have spent their reserve of nutrition and have not had time to replenish their store of warmth, so they must be reconstituted by a larger and wiser choice of food. Another evil arose from mountain stations being advertised as winter playgrounds. It would have been well but the visitors brought civilization with them. Out of doors all day—splendid—but the evenings were spent in crowded hotels and closed bedrooms. All the wicked germs who had to come with them expecting speedy death, gambolled about boldly and thrived. Overcrowding is as unsanitary in the Swiss Alps as in cities. But those invalids who live there, who have learned to avoid overexertion with consequent reaction and have got the body to fulfill of its own accord the conditions which will procure a regular output of warmth, cannot now return to the lowlands without a return of their illness.

Prefaced by a kindly and patient explanation of all that a change to high altitude means (and the author speaks after thirty-five years' experience) he goes more fully into the thermic, electric, barometric and hygrometric conditions, also pointing out that it is necessary to distinguish enrichment of blood at altitudes (say, not exceeding 10,000 feet) and impoverishment, which certainly begins for most at 8,000, particularly within the tropics. To distinguish between these two stages is the office of the new science, hematology, in which Dr. H. C. Lombard and Dr. William Marcet have done splendid work.

The chapter on Air at Altitudes is easy and pleasant reading and gives the balloon experiments of Professor J. Quale of Zurich with mountain sickness and blood and the latest British experiments by Barcroft, Roberts, Mathison and Ryffel. The monks in the Great St. Bernard Pass and the community at Avers are well described. The mortality statistics concerning them enlist the attention in an unusual way. The claims of the seacoast are admitted, but highest honor is given to the sun as doctor and friend. Some of the stodgy volumes on the question of altitude and health show how difficult it is to fit pretty garments of speech on angular facts, or to write persuasively so that those damaged in health may joyfully pack their suitcases and climb to health, but we can imagine many wheezing, coughing, holloweyed, one-foot-in-the-grave persons taking that foot out again and, limping but rejoicing, seeking the pure air of the mountains.

A LABOR VERSUS CAPITAL PLAY.

Touch and Go. A Play in Three Acts. Plays for a People's Theatre. By DAVID H. LAWRENCE. New York: Thomas Seltzer, 1920. pp. v-103.

Mr. D. H. Lawrence, whose field has heretofore been the analysis of more personal passions, has turned his eye upon the industrial situation and produced a labor capital play, a play with a preface. As is usual in such instances, the preface is more illuminating than the play. In the preface Mr. Lawrence tells what he thinks about a great many subjects, including a People's Theatre. A People's Theatre he conceives as a place where will be produced plays about people—"not noses on two legs, not burly pairs of gaiters, stuffed and voluble, not white meringues of chastity, not incarnations of co-responsence"—in contradistinction to the *Chu Chin Chow* sort of thing.

Unfortunately *Touch and Go* is not a play about people. It is a tedious and wordy affair, utterly lacking in direction or in high moments. The theme is a strike in the colliery of Barlow and Walsall and young Gerald Barlow's refusal to have anything to do with what he regards as a mess. In the mob scene at the end Gerald tells the men that he wants a new way of life, that he doesn't care about money, but that he is not going to be bullied. And a ribald voice from the mob, with one of the few touches of conviction in the play, answers, "No, because you've got everything."

If the characters are to be taken as at all representative of their respective classes, Mr. Lawrence regards labor as inexpressibly stupid and capital as jaded but stubborn. He also regards them as natu-

ral enemies. "The two dogs are making the bone a pretext for a fight with each other. . . . Labor not only wants his debt. He wants his pound of flesh. . . . What's the solution? There is no solution. But still there is a choice. There's a choice between a mess and a tragedy." Possibly the workers will not be as concerned as Mr. Lawrence in seeing that they are tragical instead of messy and in going through the conflict beautifully. There are affairs of more importance. Mr. Lawrence in this play writes like a minor poet who has strayed from his daisy field.

A PSYCHOANALYTICAL SHERLOCK HOLMES.

The Ivory Disc. By PERCY JAMES BREBNER. New York: Duffield & Co., 1920. Pp. 254.

An uncanny kind of doctor is taking the place of the ones created by Barrie, Wendell Holmes and earlier writers. He is a psychoanalytical Sherlock Holmes with a touch of the Eastern mystic, yet sufficiently human to yield to the modern idea that love is to take, no matter how many husbands or children the lady already possesses. He has a laboratory, always locked, and is experimenting with some new poison which will kill the toughest villain in five minutes. Or a sudden death has occurred. "Heart disease," says the jury, but the doctor's steely blue eye has a peculiar glint of suspicion in it. He has the body exhumed and triumphantly exposes the villainy of a murderer.

Dr. Bruce Oliver manages to carry on his detective work and woo the wife of a polished Indian professor at the same time. Now this professor sends his pretty young English wife around with a ring containing subtle poison which she unconsciously injects during a handshake, and it naturally makes him angry to see his wife growing to lose her fear of him and his hypnotic powers lessening. Meanwhile Dr. Oliver "felt that she was his, not through overmastering passion, but by right of love. He had said no word of love to her until love was with them suddenly, not to be denied, not to be considered a crime." His only hope lies in exposing the professor, but this man is very wily and glosses evil intentions with a suave manner. His evil intention of adding the doctor to his poisoned victims is frustrated by the ivory disc, a talisman given him by Estelle, the bad professor's wife, whom he finally persuades to leave her husband and live in a lonely cottage with a trained nurse until a divorce or annulment of Indian marriage is obtained. While there she greatly desires her dog, and Dr. Oliver will fetch it for her. Then we have a mysterious house right in the heart of London, dim lights, soft footed servants, a sudden surprise in the professor's study and Oliver is swiftly strapped to a chair until his enemy shall choose to touch him with the fatal ring. But the Indian servants discover the talisman on his neck and superstition induces them, when bidden to leave the room, to loose the big dog, who hates the professor, for his protection. Brutal thrashings, since Estelle's departure, have made the animal vindictive. He scents out his master just as the hour has struck for the poisoning, then a deadly, horrible

fight takes place with Oliver utterly powerless to help. Finally the professor is killed, the dog also, because it rubs against the ring, and the doctor is free to wed Estelle.

The story will be enjoyed by those who revel in improbabilities. We do not meet any of these mysterious practitioners in New York; they have enough to do getting toxins out of their patients without putting any in. Of course, the women patients can invest the most plump, jovial and ordinary doctor with occult powers. Many owe their large practice to this blessed blindness of woman-kind, but if such stories as these flood in we shall have even women a little inclined to avoid friendly handshakes, hypnotizing glances, dimly lighted reception rooms and anything supposed to be oriental.

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

TRUE LOVE. By ALLAN MONKHOUSE. New York: Henry Holt & Co., 1920. Pp. vi-373.

THE BROKEN LAUGH. By MEG VILLARS. New York: Robert M. McBride & Co., 1920. Pp. vii-343.

THE ELFIN ARTIST AND OTHER POEMS. By ALFRED NOYES. New York: Frederick A. Stokes Company, 1920. Pp. ix-187.

TOUCH AND GO. A Play in Three Acts. Plays for a People's Theater. By D. H. LAWRENCE. New York: Thomas Seltzer, 1920. Pp. v-103.

HEALTH AND SOCIAL PROGRESS. By RUDOLPH M. BINDER, Ph. D., Professor of Sociology, New York University. New York: Prentice-Hall, Inc., 1920. Pp. i-295.

ALL THINGS ARE POSSIBLE. By LEO SHESTOV. Authorized Translation by S. S. KOTELIANSKY. With a Foreword by D. H. LAWRENCE. New York: Robert M. McBride & Co., 1920. Pp. vii-244.

PROBLEMS OF POPULATION AND PARENTHOOD. Being the Second Report of and the chief evidence taken by the National Birthrate Commission, 1918-1920. New York: E. P. Dutton & Co., 1920. Pp. v-423.

MIND ENERGY. Lectures and Essays. By HENRI BERGSON, Member of the French Academy, Professor in the College de France. Translated by H. WILDON CARR, Hon. D. Litt., Professor in the University of London. New York: Henry Holt & Co., 1920. Pp. x-262.

LETTERS FROM THE KAISER TO THE CZAR. Copies From Government Archives in Petrograd Unpublished Before 1920. Private Letters From the Kaiser to the Czar Found in a Chest After the Czar's Execution and Now in Possession of the Soviet Government. Copied and Brought From Russia by ISAAC DON LEVINE. Illustrated. New York: Frederick A. Stokes Company. Pp. xxxv-264.

THE SHIBBOLETHS OF TUBERCULOSIS. By MARCUS PATERSON, M. D., Medical Superintendent, Metropolitan Asylums Board, Colindale Hospital; Late Medical Superintendent, Brompton Hospital Sanatorium, Frimley; Medical Director, King Edward VII Welsh National Memorial Association; Resident Medical Officer, Brompton Hospital, London. New York: E. P. Dutton & Co., 1920. Pp. xi-239.

OPERATIVE GYNECOLOGY. By HARRY STURGEON CROSSEN, M. D., F. A. C. S., Associate in Gynecology, Washington University Medical School, and Associate Gynecologist to the Barnes Hospital; Gynecologist to St. Luke's Hospital, St. Louis Maternity Hospital, and Bethesda Hospital. Second Edition. Illustrated. St. Louis: C. V. Mosby, 1920. Pp. v-717.

Miscellany from Home and Foreign Journals

Delayed Arsenical Poisoning Following the Administration of Salvarsan Preparations.—George S. Strathy, C. H. V. Smith, and Beverley Hannah (*Canadian Medical Association Journal*, April, 1920) report their observations in fifty-eight cases of delayed poisoning following administration of salvarsan and mercury. Forty-seven of these showed symptoms referable to the liver, jaundice, decreased digestive power, and liver atrophy. Eight were fatal and showed at autopsy marked atrophy of the liver. Atrophy of the liver may be marked in patients who ultimately recover. This condition can be diagnosed by the x rays. Dermatitis occurred in eight cases; five were severe with marked exfoliation. Peripheral neuritis was observed in two cases. Albuminuria was present in over fifty per cent. of the cases; edema was found in two. The onset of the symptoms seldom occurred until five weeks after the administration of salvarsan had ceased. The earliest symptoms of poisoning of the liver were bile in the urine, albuminuria, loss of appetite and jaundice. These symptoms should be looked for in all patients receiving salvarsan treatment, and on their appearance the administration of the remedy should cease. By x ray examination atrophy of the liver may be diagnosed at an early stage. Where evidence of liver damage is present, the diet should be reduced to a minimum. Dermatitis with atrophy of the liver occurred in one patient who received arsenic in the form of Fowler's solution, five minims three times a day for five months.

Specific Aortitis.—William D. Reed (*Boston Medical and Surgical Journal*, July 15 and 22, 1920) says that syphilitic disease of the aorta is one of the most common and most serious findings in all cases of acquired syphilis. The lesion is essentially mesoaortitis, and a manifestation of active syphilis; its conception as a parasymphilide being made untenable by the discovery in 1906 of the spirochete directly in the aortic lesion. The aortic process frequently extends to the aortic cusps, and Warthin has shown that relatively often there is an accompanying myocarditis of spirochetal origin. Aortic roughening, aortic regurgitation, dilatation or aneurysm of the aortic arch, and angina pectoris are common in syphilitic aortitis. Aortic or mitral stenosis is of exceptional occurrence in connection with specific aortitis. Nonsyphilitic forms of aortitis are rare. Many cases may be called latent, in that symptoms are absent; such cases are commonly undiagnosed until disclosed, perhaps, in a routine röntgen examination. There is no one point on which a diagnosis should be based, but only after a study of all the facts in a given case should a decision be rendered. Every case of cardiac disturbance of obscure origin, especially if the patient is a young adult, and if there are signs of involvement of the aortic valve, should promptly suggest the probability of syphilitic causation. A positive Wassermann reaction is of confirmatory value, but is frequently absent. Röntgen examination, though unreliable in early cases, gives

perhaps the most reliable findings. Specific aortitis evidences a tendency to progressive impairment of the heart and aorta and is of serious import. Treatment should be directed primarily toward killing the spirochetes in the aortic lesions. Decompensation of the heart is to be treated as in that of nonsyphilitic origin. Early diagnosis is imperative. There should be a greater willingness on the part of clinicians to make a tentative diagnosis of specific aortitis and a resort to a therapeutic test.

Sporotrichosis of the Genital Organs.—A. Brainos (*Paris médical*, March 20, 1920) reports two cases, both in young men, illustrating the fact that sporotrichosis may be localized upon the genitals and cause a septicemic reaction. In one of these cases the omission of potassium iodide in the anti-syphilitic treatment at first administered—without result—led to the thought that sporotrichosis might be present, for had the iodide been used from the first, prompt recovery would have occurred and a wrong diagnosis of syphilitic gumma probably have been made. Cultures showed the sporotrichum in this case, which recovered rapidly under potassium iodide by mouth and iodine-iodide solution locally. Whenever the physician administers the antisyphilitic therapeutic test in a case with a local lesion the syphilitic nature of which is confirmed neither by laboratory tests nor clinical study, potassium iodide should be omitted, in order to permit of differentiation between syphilis and sporotrichosis.

Comparative Study of the Wassermann Test and the Hecht-Weinberg-Gradwohl Modification.—A. J. Blaivas (*Journal of Laboratory and Clinical Medicine*, January, 1920) states that seventeen per cent. of the 100 sera examined had no hemolytic index, so that the Hecht-Weinberg-Gradwohl test could not be done. Nineteen cases showed a positive or borderline Hecht-Weinberg-Gradwohl test and a negative or borderline Wassermann. Of the fourteen of these cases in which the history was obtainable there was generally direct evidence of an early infection or of a mild easily overlooked case of syphilis or of a syphilitic association or consanguinity. In sixty-five per cent. of the cases the reactions were the same. Five per cent. showed a strong positive in the modified test, and a negative Wassermann reaction. An additional five per cent. were positive in tubes twelve and thirteen in the Hecht-Weinberg-Gradwohl test, and negative in the Wassermann, and four per cent. were positive in tube thirteen in the Hecht-Weinberg-Gradwohl test, and negative in the Wassermann. Blaivas believes that the Hecht-Weinberg-Gradwohl test should never be used alone to diagnose syphilis, but always in conjunction with the Wassermann test, and that a physician should be very wary in pronouncing a case syphilis when the modified test is positive and the Wassermann is negative. Blaivas's results are not in conformity with Gradwohl's claim that a complete inhibition of hemolysis is obtained in the Hecht-Weinberg-Gradwohl test, as he obtained several borderline reactions.

The Colloidal Gold Reaction with Cerebrospinal Fluid.—Ellis Kellert (*American Journal of the Medical Sciences*, February, 1920) considers the colloidal gold reaction to be useful as an additional or confirmatory test. It is of greatest value in the syphilitic diseases of the central nervous system, especially tabes and paresis, and it may serve to differentiate between tuberculous and other forms of meningitis. The reaction is correct in approximately eighty per cent. of cases. Cerebrospinal fluid contaminated with blood in small quantity frequently gives reactions in the luetic zone. Positive results unconfirmed by other tests are of only slight value. The Wassermann reaction and the cytological examination of the cerebrospinal fluid are of greater value than the colloidal gold test.

Contraction Waves in the Normal and Hydro-nephrotic Ureter.—Wilder G. Penfield (*American Journal of the Medical Sciences*, July, 1920) says that the ureter is a muscular tube which, when subjected to partial obstruction, always dilates, usually hypertrophies, and whose peristaltic rate is increased. Contraction waves pass in either direction with equal facility, depending on the location of the area whose rate of spontaneous contraction is most rapid. This area is normally in the renal pelvis, but abnormally a more rapid pacemaker may be established elsewhere. It is suggested that underlying the more rapid rhythm of the pacemaking area is the fact that its metabolic rate is more rapid than in any other level of the ureter. Production of a constriction ring which becomes pacemaker for the ureter above and below it depends on three things: the metabolic gradient, ureteral distention and refractoriness during contraction and the first part of relaxation. It is suggested that in the passage of a ureteral stone, trauma and inflammation increase the rate of metabolism in the ureter wall about the stone, a constriction ring results, followed by distention of the ureter and retroperistalsis. This would cause great distention of the renal pelvis and give to renal colic its peculiar rhythmical character.

Renal Manifestations in Heart Weakness.—O. Josué and M. Parturier (*Paris médical*, March 13, 1920) note that in heart cases with manifest signs of renal insufficiency there has been a natural tendency to ascribe these signs to actual renal disease coexisting with the cardiac disturbance. As a matter of fact, however, simple oliguria from heart weakness is sufficient to bring about a renal syndrome with azotemia or anasarca, and many cases classed as cardiorenal on the basis of both blood and urine examinations are not actually cardiorenal cases. Recognition of actual participation of the kidneys in the syndrome is not possible during the period of heart weakness and oliguria, but after digitalis has acted and diuresis become reestablished, the desired information may be secured, in particular with the aid of Ambard's ureosecretory coefficient. Often the kidneys are thus shown to be quite normal; or the kidneys may be slightly diseased, yet sufficient to eliminate urea so long as cardiac compensation persists. A high Ambard coefficient gives warning that in the event of loss of compensation,

prolonged oliguria will prove a more serious matter than usual. In all heart cases exhibiting a renal syndrome with oliguria, even though heart weakness is not pronounced, impaired renal function due to heart weakness should be thought of and heart tonics prescribed. Edema and oliguria are alike among the earliest and most reliable signs of cardiac insufficiency. Before the myocardium is toned up with digitalis, aqueous plethora must first be reduced by venesection and drastic purgation, which often relieve dyspnea at once and enable the patient to sleep. A milk diet should be ordered, and in cases with extreme oliguria, water alone allowed. Not more than 1,500 mils of fluid, with 100 to 150 grams of lactose, should be permitted in the twenty-four hours. Nativelle's digitaline in single daily doses of thirty to thirty-five drops is the best heart remedy for these cases. In grave cases, with persistent oliguria and increasing azotemia, such doses should be kept up for three, four, or even five days, in order finally to induce diuresis. When the latter does set in, the digitaline should be continued but gradually tapered down. Where oliguria is continuously threatening, digitaline may be advantageously kept up for some time in daily amounts of five to ten drops. Neither the albuminuria, azotemia, nor high blood pressure contraindicate the drug in these patients, but are instead benefited by it. Theobromine, 1.5 to two grams a day, may be combined with the digitalis or follow it. The salt free diet will assist in the removal of edema, but once the usual cardiac energy has been restored, salt may be resumed without causing edema to reappear.

Coxofemoral Arthritis Following Ingestion of Hexamethylenamine in Large Amounts.—Pierre Marie and Pierre Béhague (*Bulletin de l'Académie de médecine* May 11, 1920) report the cases of two men aged about forty years who, in order to escape from German prison camps, ingested massive doses of urotropin. Nearly 100 grams of the drug were taken in twenty-four hours, and in one case the total amount taken is estimated to have been one kilogram. In both instances marked and painful hematuria set in a day or two later, passing off two or three days after the drug was discontinued. Upon their return to France the men seemed to have completely regained their health, but in one instance ten months and the other eighteen months after the use of the drug there developed a progressive arthritis sicca of both hip joints, which became so marked that the patients could walk only with great difficulty and have remained thus incapacitated ever since. In one case x ray examination showed considerable changes in the head of the femur, which was irregular and presented cauliflowerlike masses projecting beyond the joint surfaces. In the other case the changes were less marked, but there were visible some ridges and irregularities completely surrounding the joint and the femoral head likewise showed deformity. The precisely similar effects in the two cases suggest that the drug was responsible for these joint changes. Experiments are being conducted to elucidate the matter and have already been attended with somewhat suggestive results.

Anomalies of the Bile Ducts.—Daniel N. Eisendrath (*Surgery, Gynecology and Obstetrics*, July, 1920) in discussing the possibility of injury to the bile ducts gives the anomalies which may occur as follows:

1. The gallbladder may be absent, rudimentary or hour glass; it may lie more or less completely enveloped by the liver (intrahepatic form); the pelvis may be on the upper instead of the lower side (reversed ampulla or pelvis); right hepatic duct may empty into the gallbladder; there may be transposition of viscera.

2. The cystic duct may be double, i. e., there may be two cystic ducts; the hepatic (right) duct may empty into the cystic duct; an accessory hepatic duct may empty into either the cystic or the angle of junction of the cystic and main hepatic ducts; the cystic duct may be so greatly dilated as to be almost indistinguishable from the main hepatic duct; the cystic duct may be very small and extremely short; parallelism (short or long) is present in seventeen per cent., and a spiral course of the cystic in eighty per cent. of individuals.

3. The hepatic ducts. There may be four or five instead of one main duct, which is formed just outside of the liver, and accessory hepatic ducts.

4. The common duct may be extremely short or very long; a double common duct may be present; in nearly ninety-five per cent. of individuals the common duct lies within the pancreas.

5. The blood vessels. There may be anomalies of the right hepatic artery; of the single cystic artery; of the double cystic arteries; and of the gastroduodenal artery.

Sliding Hernia.—Louis Frank (*American Journal of Surgery*, March, 1919) discusses sliding hernia and presents the following conclusions:

1. Sliding hernia (*hernie par glissement*) involving any of the abdominopelvic viscera is infrequently encountered, and sliding vesical hernia is the rarest type known.

2. Sliding hernia is noted with greater frequency in males than females in the proportion of about four to one; it usually accompanies inguinal hernia in the former and femoral hernia in the latter.

3. Sliding hernia seldom occurs in young subjects of either sex, those of middle and advanced age being most susceptible; but there are strange exceptions to this rule.

4. No viscus completely invested by peritoneum can become the sliding part of a hernia, in the absence of anatomic abnormality.

5. The anteoperative diagnosis of sliding hernia, irrespective of what may be the sliding viscus, is a physical impossibility.

6. The sliding portion of a sliding hernia cannot become strangulated, although strangulation of the true contents of the hernial sac is commonly observed.

7. The treatment of hernia, including the sliding type, is essentially surgical; and unless the nature of the pathological condition is promptly recognized and extreme care exercised in executing the operative steps, irreparable damage may be inflicted upon the sliding viscus.

Diabetes Due to Syphilitic Disease of the Pancreas.—P. Carnot and P. Harvier (*Paris médical* May 15, 1920) report the case of a woman aged fifty-three years, exhibiting both syphilitic nervous disease—beginning tabes and sacral anterior poliomyelitis—and diabetes with loss of weight and marked glycosuria. At the autopsy a syphilitic cirrhosis of the liver and fibrogummatous syphilitic pancreatitis were found, the latter process having resulted in almost complete disappearance of all pancreatic tissue. The clinical and pathological features were so clear cut as to establish beyond a doubt the occurrence of a form of diabetes due to syphilitic disease of the pancreas.

Urogenital Tuberculosis.—M. J. Latimer (*Urologic and Cutaneous Review*, May, 1920) says that urogenital tuberculosis is the most curable of the various forms of surgical tuberculosis; routine general and local examinations are essential to a correct understanding of all the associated factors and the definite localization of foci; the treatment of election is radical surgical procedure; accessible foci should be eradicated, even where radical elimination of all foci is impracticable; palliative surgery is especially indicated in advanced cases because it often is thereby possible to eliminate the almost constantly present factor of mixed infection and secondary toxemia.

Traumatism of the Spleen.—E. L. Connor (*Canadian Medical Association Journal*, June, 1920) says that ruptured spleen can only be treated as a surgical condition of the abdomen. Although the severe symptoms may be delayed, we should more often think of this condition in examining patients with histories of slight injury to the lower left thoracic region. Pain in the left shoulder, when no injury can be found about the joint, should at least be considered as being referred from the spleen. Splenectomy is not a difficult operation and should be undertaken by any man who has reasonable operating facilities. Ruptured spleen should always be considered as a condition demanding early treatment rather than postponed treatment at some large centre.

Fishscale Gallbladder.—John Ripley Corkery (*Annals of Surgery*, June, 1920) from a study of museum and fresh studies of so-called multiple small cysts of the mucosa of the gallbladder presents his conclusions as follows:

1. Multiple small cysts of the mucosa is a misnomer for this condition.

2. Fishscale appearance is due to chronic inflammation.

3. Lipoid substance leaves an apparent trail from the lumen of the blood vessel to the lumen of the gallbladder and is a constant feature in active cholecystitis in this condition.

4. Lipoid substance occurs in leucocytes in fishscale gallbladder.

5. The large polygonal cells in the submucosa may be transitional leucocytes.

6. The process of inflammation of the gallbladder is practically identical with inflammation of the appendix and barring mechanical difficulties the end result is the same, i. e., obliteration.

Proceedings of National and Local Societies

AMERICAN GYNECOLOGICAL SOCIETY.

Forty-fifth Annual Meeting, Held in Chicago, May 24, 25 and 26, 1920.

The President, Dr. ROBERT L. DUNNINGTON of New York, in the Chair.

Analgesia and Anesthesia in Labor.—Dr. EDWARD P. DAVIS, of Philadelphia, stated that the best quality of ether, skillfully administered, was successful in the majority of cases of spontaneous labor during the second stage. If given at the height of the pain, quickly removed as soon as the pain subsided, it stimulated and did not retard labor, but the moment when expulsions occurred a few deep inhalations without air would render the patient insensible to pain although capable of comprehending sensations of feeling, hearing, or often of sight. The mother roused easily after delivery and required no anesthesia while the placenta was separating. For the insertion of stitches immediately after labor ether properly administered with oxygen was comparatively safe and efficient. He had seen no evidence that such use during the stage of expulsion injured the fetus. It was true that ether was inflammable, that some patients were excited by it, that it was irritable to the bronchial tubes and kidneys, and that it was difficult to anesthetize some patients with ether, but if skillfully administered it was usually successful and its combination with oxygen rendered it in his experience the safest of obstetrical anesthetics.

The modern anesthetizer should be prepared to use nitrous oxide and oxygen, ether and oxygen, chloroform with or without oxygen, changing, if necessary, from one to the other of these during a prolonged operation. In special fields of surgery the invention of special apparatus had made anesthesia vastly more accurate and successful. For the obstetrician analgesia or anesthesia, skillfully given, made for more accurate diagnosis during labor and for the successful management not only of spontaneous and normal parturition, but of complicated conditions. It was a familiar fact that recovery from parturition was greatly delayed by exhaustion during labor. In this regard modern analgesia and anesthesia were among the greatest advances made by modern obstetrical science. One must not forget the considerable fetal mortality and morbidity produced by prolonged birth pressure and by unregulated and violent expulsive efforts. The danger of asphyxia to the fetus during labor by analgesia and anesthesia was vastly less than the danger of hemorrhage from birth pressure and the avoidance of this latter complication was greatly enhanced by obstetrical analgesia and anesthesia.

Induction of Labor: Indications and Methods with Special Reference to the Use of Pituitary Extract.—Dr. BENJAMIN P. WATSON, of Toronto, Ontario, said that Blair Bell in 1909 was the first to employ in practice the results of experimental investigations carried out on the extract of the pituitary gland up to that time. Since then a great mass of literature had accumulated on the subject. It

was universally recognized that it was a most valuable agent for accelerating the second stage of labor when delay was due to feeble uterine contraction. In most of the articles which had appeared the reader was warned against using it for the induction of labor or before the cervix was fully dilated. He had used it extensively for the induction of labor and during all stages of labor, and had never had any bad results. In 1913 he recorded three cases in which he had successfully induced labor by its means. One of these was at the eighth month, one at full term, and one at three weeks post term. He stated that the method was worth an extended trial and he thought that his further results bore this out. The method used was to begin with a dose of one half to one c. c. administered intramuscularly with a long needle. In most cases uterine contractions commenced in about ten minutes and increased in severity during the next twenty minutes. At the end of this time the second injection of one half c. c. was given. If, after a time, the contractions tended to weaken, or to come at longer intervals, the dose was repeated. As many as six or eight doses might thus be given at intervals of about half an hour. The important point was to administer a further dose before the effects of the previous one had entirely passed off. The effects from a single dose appeared to last only for about half an hour and there was no cumulative effect. Sufficient doses must, therefore, be given to keep up uterine contractions sufficient to produce a certain amount of opening up of the cervix. When the cervix had begun to open and the membranes to bulge into it the uterine contractions would continue without the further administration of the drug. The failures which he had in the beginning were the result of not pushing the dose far enough. He had found it perfectly safe to give eight or ten one half c. c. doses at half hour intervals.

In nineteen multiparæ the average duration of labor was nineteen hours as contrasted with eighteen hours as an average in eighteen multiparæ. With the bag method the average time elapsing before labor began was thirteen hours and the average duration of labor was ten hours. This number, of course, was very small and not sufficient to draw conclusions from. With quinine alone, in twenty-five cases the average time elapsing from the last dose to the definite onset of labor was seven hours, while the average duration of labor was nine hours, seven for multiparæ and eleven for primiparæ. With pituitrin alone in a total of eighteen cases the average time elapsing between the first dose and the definite onset of labor was two hours. The average duration of labor was ten hours, sixteen hours for five primiparæ and nine hours for thirteen multiparæ. With quinine and pituitary extract, in a total of sixty-two cases fifty-three were successful and nine were totally unsuccessful. Six of the successful cases required repetition of the routine before labor began. In the fifty-three successful cases the average time elapsing between the first dose of pituitrin and the onset of labor was two hours and

the average duration of labor was ten hours; fourteen hours for twenty-three primiparæ and seven hours for thirty multiparæ. In the quinine and pituitrin cases labor was spontaneous except in four cases in which forceps were used when the head was on the perineum. In the total of fifty-three cases there were four stillborn babies.

Dr. Watson said that recently two of his colleagues, members of his staff, J. G. Gallie and W. A. Scott, had recorded a series of sixty-five cases in which they had used pituitary extract alone for the induction of labor. Out of this total number fifty-five were entirely successful. The average number of doses given was three and the average duration of labor was seven hours. There was one fetal death twenty-eight hours after delivery from atelectasis. The delivery was normal in forty-five, by forceps in nine and by version in one.

Taking these results with those which he had recorded, he thought we must recognize that the method had a definite place in obstetrical practice and should be considered before other methods were adopted. It had very special advantages in cases of slight disparity between the head and pelvis, as it did not in any way prejudice the Cæsarean operation should it prove to be necessary—an argument which could not apply to the bougie or bag method.

The Induction of Labor at Term.—Dr. CHARLES B. REED, of Chicago, said that labor could be inaugurated by quinine and pituitrin, by castor oil and quinine, by the modified de Ribes bag or by both. The castor oil acted in about two cases out of five and most reliably when the patient was a little bit past the calculated date. The Voorhees bag, in his experience, was the most dependable and was, therefore, the favorite agent at his hospital. The patient's bowels should receive attention the night before and in the morning the external genitalia given a careful obstetrical preparation.

Assemble and sterilize by boiling twenty minutes a modified de Ribes bag No. 4 (Voorhees), a Simon speculum or vaginal retractor, a pair of long Pean forceps (dressing forceps would serve), two pairs of volsellum forceps, two pairs of compression forceps, a Goodell dilator, a tenaculum forceps, a hand bulb syringe with glass tubes and rubber connections for the bag or a large piston syringe. The bag and accessory apparatus must be tested for defects before using. The patient prepared as for delivery was placed upon the table in exaggerated lithotomy position with legs held by assistants or by stirrups. The vagina was retracted, a smear made from the cervix and the mucous membrane wiped clean with pledgets. Anesthesia was only occasionally necessary even in primiparæ. One lip of the cervix was seized by the volsellum and brought down. If the bag had been properly prepared the os would admit it originally without dilatation. The bag must be emptied of residual air and the flat end pulled out. It was next rolled into a compact mass like a cigarette and seized by the Pean forceps so that the tips extended just to the largest diameter of the rolled bag. After anointing the bag with sterile glycerin it was passed into the cervix with the concavity of the

forceps turned toward the patient's left leg and as it entered the os the concavity was turned upward one quarter of a circle so that when the maneuver was completed the curve of the instrument conformed to the flexure of the uterus. Release the lock of the introducing forceps. Connect the tube of the bag with the filling apparatus and force the sterile solution (lysol, boric acid or plain water) slowly into the bag. Do not overfill by force or the bag will break. Tension in the tube of the bag or the feeling of resistance to the injection are signs of fullness to the experienced operator. If uncertain of the technic, a measured amount of fluid might be used. A piston syringe of tested size would also serve to inform the operator when the capacity of the bag (six ounces) had been reached. The Pean forceps were removed as soon as the bag was sufficiently filled to keep it from slipping out. Snap the compression forceps on the tube; remove the volsellum from the cervix and disconnect the syringe. Tie the tube of the bag strongly with tape. Remove the compression forceps. Place two sterile pads on the vulva, one on either side of the tube. Remove the stirrups and pull the patient up in the bed. The bag might break from overfilling or being insufficiently filled might slip out of the cervix before the uterine contractions began. If so, another bag should be inserted. If the pains did not start within an hour a weight of one or two pounds was attached by a tape to the protruding tube and passed over the foot of the bed. Usually in from five minutes to half an hour the contractions began and labor was under way.

In a variable period, rarely more than four hours (three hours and twenty minutes in his series) the bag was expelled by strong pains, the dilatation was practically complete and the head followed the bag down into the pelvis, the membranes ruptured and the second stage began. From then on the case was managed according to general obstetrical principles. The tedious, exhausting, and painful first stage had been definitely shortened. The bag acted as a mechanical aid to cervical dilatation, a dynamic stimulant to the contractions and it preserved the membranes from injurious pressure until physiological rupture occurred. When the membranes had been accidentally ruptured by the insertion of the bag no attempt should be made to pull on it to mark advancement lest it come out and by suction bring down the cord. When the bag came out after accidental rupture of the membranes at the time of insertion it was good practice to make an internal examination to discover the presence or absence of a prolapsed cord.

In the series of two hundred cases hitherto reported he had 114 multiparæ and eighty-six primiparæ. The average duration of labor was seven hours and fifty-six minutes; the longest labor was thirty hours, due to a tough, inelastic cervix. Two other patients were in labor twenty-eight hours from cervical conditions. In one the cervix was a mass of cicatricial tissue. The shortest labor in a multipara was fifty-five minutes and in a primipara sixty minutes. The bag broke while being filled or shortly after insertion nine times. Another bag was introduced four times. The mem-

branes were ruptured by the insertion of the bag seven times; in one case intentionally for hydramnios. The bag was expelled in an average period of three hours and twenty minutes. The longest detention was nine hours; the shortest was ten minutes. Two mothers died. One had myocarditis associated with a marginal insertion of the placenta. Her labor lasted only an hour and a half and was accompanied by a normal amount of hemorrhage only. Death came two hours after the delivery. The other had pneumonia and died eight days after labor. In no case did the bag fail to inaugurate contractions nor the woman to deliver.

The Prophylactic Forceps Operation.—Dr. JOSEPH B. DE LEE, of Chicago, stated that the prophylactic forceps operation was the routine delivery of the child in head presentation when the head had come to rest on the pelvic floor and the early removal of the placenta. Primiparous labors and those where the conditions of the soft parts approximated a first labor, were treated by this method, which really comprised more than the actual delivery of the child. It was a rounded technic for the conduct of the whole labor, with the defined purpose of relieving pain, supplementing and anticipating the efforts of Nature, reducing the hemorrhage, preventing and repairing damage.

Sir J. Y. Simpson said that labor, according to Nature's plans, should be normal, but that in a large proportion of cases it was not so. So frequent were these bad effects, that he had often wondered if Nature did not deliberately intend women should be used up in the process of reproduction, in a manner analogous to that of the salmon, which died after spawning. The radical interference with the mechanism of the third stage was intended to reduce the amount of blood lost, shorten the anesthetic period and reduce the danger of infection from retained blood clots, membranes and insufficient uterine contraction. He freely admitted that this method of treating labor was a revolutionary departure from time honored customs and must have really sound scientific basis for recommendation. This it had. First, it saved the woman the debilitating effects of the suffering in the first stage and the physical labor of a prolonged second stage, and in the modern nervous inefficient product of civilization, this was becoming more frequently necessary. The saving of blood had much to do with the quick and smooth recoveries he had observed in his cases. In the combination with morphine and scopolamine in the first stage, gas or ether in the second stage and operative delivery, one had robbed labor of most of its horrors and terrors, and the increase of the population ought to be thus favored. Second, it undoubtedly preserved the integrity of the pelvic floor and introitus vulvæ and forestalled uterine prolapse, rupture of the vesicovaginal septum and the long train of sequelæ. Virginal conditions were often restored. Third, it saved the babies' brains from injury and from the immediate and remote effects of prolonged compression. Incision in the soft parts not alone allowed shortening of the second stage, but it also relieved the pressure on the brain and would reduce the amount of idiocy, epilepsy, etc. The easy

and speedy delivery also prevented asphyxia, both its immediate effects and its remote influence on the early life of the infant.

The Value of the Wassermann Reaction in Obstetrics Based upon the Study of 4,547 Consecutive Observations.—Dr. J. WHITRIDGE WILLIAMS, of Baltimore, said that four thousand of the women were delivered between the twenty-eighth week of pregnancy and full term—1,839 whites and 2,161 blacks. In the series a positive Wassermann was noted in 421 cases, an incidence of 4.2 per cent.; 2.4 per cent. in whites and 16.29 per cent. in blacks; 302 children were born dead or died during the two weeks following delivery, and in 102, or 34.4 per cent. death was proved to be due to syphilis. Study of the 421 positive cases showed, 1, that the presence of a positive Wassermann did not necessarily mean the birth of a syphilitic child; and, 2, that efficient treatment instituted by the middle of pregnancy gave almost ideal results as far as the child was concerned. Observations proved that a negative maternal Wassermann did not necessarily imply the absence of syphilis, as shown by positive autopsy findings in twenty-two children. Study of the significance of the fetal Wassermann at birth and a comparative study of the diagnostic value of the Wassermann reaction and placental findings, also a brief discussion of the applicability of Colles's law was undertaken.

Extraperitoneal Cæsarean Section.—Dr. JOHN A. MCGLENN, of Philadelphia, stated that extraperitoneal Cæsarean section operations could be divided into two general types: a, The true extraperitoneal in which the peritoneal cavity was not invaded at any stage of the operation; this operation would be referred to as the extraperitoneal. b, The transperitoneal in which the peritoneal cavity was opened and subsequently isolated by attaching the parietal and visceral peritoneum and the uterus opened into this artificial extraperitoneal space; this operation would be referred to as the transperitoneal.

The advantages of the two types of extraperitoneal operation might be summed up as follows: 1. The peritoneal cavity, not being opened, was isolated from the field of operation, the danger from infection was less and therefore a better operation in the infected or supposedly infected case. 2. If the uterus ruptured at the site of the incision in subsequent pregnancies or labors it was an accident of no material consequence. 3. There was no danger from the formation of peritoneal adhesions. 4. The scar was not unsightly and the possibility of incisional hernia *nil*. 5. There were no postoperative intestinal complications. 6. Hemorrhage during the operation was slight.

His own feeling was that the Beck operation with thorough protection of the peritoneal cavity and perfect peritonealization of the uterine incision was superior to the transperitoneal operation as a routine procedure. While theoretically it was not as efficient as the extraperitoneal method, practically on account of the many disadvantages of the latter, it was the better operation.

(To be continued)

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THE RELATION OF THE MEDICAL PROFESSION TO THE CAMPAIGN FOR THE CONTROL OF CANCER.*

BY ROBERT B. GREENOUGH, M. D.,
Boston.

The developments of the last ten years have brought many new duties and responsibilities upon the medical profession in the way of public service. One of these responsibilities, the control of cancer, I shall consider in this paper, and while I refer to it as a responsibility I shall hope to show you that it is also an opportunity to accomplish an immeasurable amount of good, not only to your own patients but to the community as well.

We know from the figures of the statisticians that cancer causes the death of a very large number of our population—estimated at present at from eighty to a hundred thousand persons a year. We know that cancer is one of the most common causes of death of persons over forty years of age, and we know that in spite of the best efforts of the research institutions a sovereign cure for cancer has not yet been found, and that a radical surgical operation is at present our best and surest method for the complete extirpation of the disease. We know, too, that a relatively large proportion of cases of cancer are presented for operation too late to make it reasonable to attempt a radical cure of the disease. A recent study by Simmons and Daland of the statistics of the Massachusetts General Hospital show that of 519 patients with cancer of all varieties entering the surgical wards of the hospital for treatment only forty-four per cent. were suited even for the attempt to be made to accomplish a radical cure by operation. When we consider that the operative mortality diminishes this number further, we find that only thirty-eight per cent. of these 519 patients stood any chance whatever, of a radical cure. We must remember, also, that the results of any attempt at radical cure are problematical, according to the location of the disease, and the expectation of failure is in many regions greater than the expectation of success. It behooves us, therefore, as the health officers of the community, to consider this situation and do all that lies within our power to obtain a control of the situation which we do not now possess. Four

lines of attack present themselves at once for our consideration:

1. The education of the public to the early symptoms of the disease.

2. The instruction of the medical profession as to the actual facts of this serious situation to bring about earlier diagnosis.

3. The promotion of investigations on the part of surgeons in regard to more effective means of operative treatment.

4. The promotion of investigations in the laboratory in regard to the causes of cancer, and of methods of treatment other than by operation.

It is with the second line of attack that we are especially concerned, but a brief reference to what has been done in other fields may make our problem easier and better defined. The last ten years have seen a very marked difference in the attitude of the public toward matters of public health. A knowledge of disease has been obtained by the layman, far more accurate and intelligent than he ever had before. This is the result of the many agencies which have taken up the problem of educating the public for its own protection. Starting with tuberculosis and extending over such diverse subjects as baby hygiene and venereal disease, health matters have been given wide publicity, and topics never formerly mentioned in the lay press are now subjects of frequent notice and discussion. In this campaign of publicity the American Society for the Control of Cancer has had an important share, and it has been ably seconded by progressive health commissioners and public health officers who have seen the value of an educated public in relation to public health.

By the use of the lay press, the magazines—especially the women's and household magazines—by posters, by health department publications, through churches and women's clubs, and by the normal agencies for the spread of medical information, nurses and physicians, this education of the public can be brought about.

The facts which have to be impressed upon the public are relatively few and simple. The layman must be taught that delay is dangerous, that it is in the early and not the late case that the patient with cancer can be cured by operation, and that in early cases operation can, and does, cure many patients with this disease. It is an unfortunate fact that it is the failures and not the successes of the operative treatment of cancer that are known to the public.

*Presented before the Medical Society of the County of New York, May 24, 1920, and at a meeting of the Queens-Nassau Medical Society, Jamaica, Long Island, May 25, 1920.

Women who have been cured of cancer by an amputation of the breast or by a hysterectomy, do not allow even their intimate friends to know of the fact, but the death certificate rarely fails to indicate the cause of death correctly in unsuccessful cases. The public must be made to understand that unlike most other diseases pain does not occur as a symptom of early cancer, and they must learn that a lump or sore, or any abnormal discharge, especially if it contains blood, is a symptom in a person of cancer age which demands immediate and competent medical examination. It is asserted that a distinct improvement is already evident in those districts in which the education of the public has been carried on systematically, but there is a great deal more to do before the work is finished.

In this education of the public the physician must take his part, and it is an important part. The community of his own patients look to him for information on subjects of this character. Articles in the newspapers and magazines may arouse the layman's interest but it is his own physician to whom he appeals for corroboration. In the education of the public, therefore, the physician has a definite duty to perform. In the 519 cancer cases referred to, an average delay of five and four-tenths months occurred after symptoms were first noticed by the patient before he consulted a physician. Although the lapse of this amount of time is more serious in some cases than in others, it is far too long in any case for the best interests of the patient, and it must be shortened very materially and patients must be induced to consult their medical advisers much more promptly if we are to make progress in combating the disease.

By means of the instruction of the public we may confidently hope to bring the patient to his physician at an earlier stage of his disease. In doing this, however, we add enormously to the difficulties and responsibilities of the physician. It is a well established fact that the typical textbook symptoms of cancer of any organ are, as a rule, the symptoms of cancer that has extended beyond the possibilities of radical cure. If we wish to secure for every person afflicted with cancer the opportunity for cure to which he should be entitled we must abandon the textbook symptoms of advanced cancer and deal with the earliest symptoms of the disease. Under these conditions a positive diagnosis will often be impossible, and a method of dealing with these suspicious but doubtful cases must be made available. The first step, however, in this direction depends upon the examination of the patient. No sense of false modesty on the part of the patient or of indifference on the part of the physician should be allowed to interfere with the investigation by direct digital or visual examination, or with instruments if necessary, to obtain positive data for the establishment of a diagnosis. A Fabian policy of delay deprives a patient of an opportunity for cure, and thus signs the death warrant of many a patient who could otherwise be saved.

In the 519 cancer cases at the Massachusetts General Hospital to which I have referred, an average delay of three months occurred after the

patient first consulted his physician before operative treatment was advised. It is interesting to note the confidence of the patient in his physician's advice, for the average delay on the part of the patient after he had once been advised to undergo operation was only three weeks. It is clearly the duty of the physician to see that the patient's confidence in him is not misplaced, but we must admit that an average delay of three months at arriving at a diagnosis is far too long if we are dealing with a disease which progresses so rapidly as cancer does at this critical period of development.

In dealing with the group of early and doubtful cases of cancer the question of the exploratory incision and removal of tissue for microscopic examination becomes a serious one. The trend of the best surgical opinion is strongly opposed to any incision into cancer tissue when a positive diagnosis is otherwise available, on the ground that incision gives opportunity for an immediate spread of the disease. While this risk undoubtedly varies considerably with the location of the primary tumor there are some tumors in which the exploratory incision is successfully practised when a positive diagnosis cannot be made in any other way. There are other tumors, however, such as cancer of the breast or bone sarcoma, where a preliminary incision for the removal of tissue for examination, to be followed after a week or ten days delay by radical operation, is almost universally condemned. Such cases are best treated by incision and frozen section diagnosis when necessary, and the radical operation completed immediately, under one anesthesia. In fact, the use of the frozen section with immediate microscopic examination is probably the safest measure in any case where a biopsy is necessary to obtain a diagnosis sufficiently certain to justify the radical operation.

The term precancerous lesion is one which has been employed of recent years to indicate those essentially benign lesions which experience has shown appear too often as precursors of actual malignant disease. While the term is perhaps unfortunate in the sense that all lesions of this nature do not necessarily result in cancer, the frequent incidence of malignant disease in cases of this kind demands that treatment of these characteristic lesions be carried out with this principle in mind.

The lesions which commonly fall into this so-called precancerous group are as follows: Keratoses and papillomata of older persons, leucoplakia, fissures and sores of the lips, tongue and marginal mucous membranes, lacerations of the cervix, and benign tumors of the breast, thyroid and other organs. In this group, also, should be placed the pigmented moles which are so commonly distributed over the body, and which under any form of continued irritation are likely to give rise to the frightfully malignant tumor known as melanosarcoma. A very appreciable number of cases of cancer develop at the site of precancerous lesions of the type described. It is not open to doubt that the removal or destruction of the precancerous lesion would have saved the patient from the more serious disease. In this respect removal by surgical measures—generally an operation of the most minor

character—is the best method of treatment in that the total removal is accomplished and the tissue is made available for pathological examination. In this connection the establishment of a free diagnosis service for cancer tissue, by the public health departments of the states, or by the state universities, gives opportunity for the examination of such suspected tissue free of charge. Under these conditions the failure of a surgeon to submit the tissue removed for examination deprives his patient of the advantage of an accurate pathological report, to which, as a citizen of the state, he is entitled.

Where for any reason removal by surgical measures is not expedient, destruction of the lesion, if it is a small one, can be accomplished by the use of radium or x rays. This destruction, however, should be secured if possible by one vigorous and adequate exposure, for repeated irritation, either by radiation, by chemicals, or by any other agent, is to be strenuously avoided. It is by chronic irritation that we believe most of the so-called precancerous lesions are converted into cancer.

The operative treatment of cancer in its various locations has been so standardized in the operative clinics of the world that little opportunity exists for individual variation. This standardization has been brought about by the study of operating room and autopsy material which has shown the typical lines of extension from the original focus of the disease, which are characteristic and different for each of the common sites of cancer. Although the external incision may vary the anatomical structures removed are the same in practically every operating clinic for cancer in each of its common situations, and the general principle of avoiding by a wide margin the possibility of incision into cancer tissue at the time of operation is universal.

In a recent pamphlet issued by a committee of the American Society for the Control of Cancer these matters are discussed, and the standard operative procedure and the differential diagnosis of cancer in its many situations have been summarized. This pamphlet has been reprinted by the health commissioners of a number of states, and issued to every practising physician in the state.

While the operative treatment has thus been standardized it must be admitted that the prospects of success vary greatly with the different situations in which cancer most commonly occurs. While this variation is due, in part, to the rapidity of growth and extension of the individual tumor, it is determined even more by the anatomical situation in which the tumor lies, for this is the factor which limits the extent of local removal of tissue which can be sustained. We must hope, therefore, that further improvements in surgical technique may give us methods of attacking and removing the disease successfully in situations which are at present beyond operative attack.

Recent developments have shown that the combination of radium and x ray treatment with operation adds materially to our resources and gives promise of success in the treatment of certain cases of cancer in and about the mouth, and in other regions which with operation alone would of necessity be considered beyond hope of relief. In certain cases, also, the destruction of a local lesion may be

accomplished by the use of radium and the cautery accompanied by the subsequent dissection and operative removal of the regional lymphatics. In this way the attempt may be made to cure a certain number of cases which would otherwise be inoperable and beyond relief. In the line of development of these combined operative measures advances in the surgical treatment of the disease may confidently be expected.

In the many cancer research institutes of this country and abroad studies have been carried on looking to the discovery of the cause of cancer, its manner of growth, and the methods other than operation by which it may be expected to be cured. While none of these problems have been brought to a final solution many facts have been established of the greatest value in the treatment of disease. From the transplantable tumors of mice facts have been obtained which have determined both the advantages and dangers of the treatment of cancer by radium and the x rays. The fact that there is a degree of natural resistance to the growth of cancer tissue has been established. Experimental confirmation has been obtained to support the dictum that rough handling and massage of cancer tissue increases the rapidity of the spread of the disease, and it has been determined by the same means that the clean incision into cancer tissue for the removal of a specimen for microscopic examination is the safest measure to obtain a certain diagnosis when circumstances make a positive diagnosis necessary that is otherwise unobtainable. From the laboratories, also, evidence has been produced to show that the supposed relation of chronic irritation of one kind and another to the production of cancer is of great significance.

In the cancer research institutes many of the methods advertised from time to time as effective methods of treatment of cancer have been investigated. Many so-called cancer cures have been put before the public and new ones develop from day to day. Some of these measures are assumed to destroy the disease by biological methods, and others are of bacterial or chemical nature, but none has yet been found to be of sufficient value to justify its acceptance by the medical profession as a whole. It is the duty of the cancer research institutes, however, to continue the investigation of these suggested remedies, and to prosecute the search for *any* remedy which may be applied to advantage in the treatment of this disease.

There is no room to doubt that in radium and the x rays agents of the greatest value in combating cancer have been made available. While it is perhaps true that the first claims as to the successes of these methods of treatment were somewhat exaggerated a place has now been found for each of them, and in that situation they are productive of the greatest good. There is reason to hope, also, that further investigation of these two agents may make their value in the treatment of cancer greater even than it is at present.

In this brief communication I have tried to show that the situation in regard to cancer is at present a very serious one, and that it demands the best efforts of the whole medical profession toward its relief. While the first step must be taken by the education

of the public to the dangers of delay and the recognition of the early symptoms of cancer, more must yet be done to help the physician to recognize the disease in its earliest and curable stages, in order that his patient may have the benefit of such resources in the way of operation and other methods of treatment as the community affords. We must teach that the so-called precancerous diseases justify and demand treatment in prophylaxis of cancer, and, finally, we must support in every way we can the investigations which are being carried on in hospitals and in laboratories all over the world to improve the effectiveness of our methods of treatment of this insidious and frightful disease.

8 MARLBOROUGH STREET.

THE USE OF RADIUM IN ESOPHAGEAL CANCER.

BY HENRY HALL FORBES, M. D.,
New York.

The gloomy outlook for the patient suffering from esophageal cancer, and the gravity of the transthoracic operation with one cure to the credit of the procedure, the famous case of Dr. Torek (1 and 2), gave me a stimulus to use our available supply of radium in a series of cases in the nose and throat department of the New York Post-Graduate Hospital, where the director, Dr. Duncan Macpherson, has referred all cases to me. This has been done with my associate Dr. George Stuart Willis, who is in charge of the radium department of our institution and who has been in charge of the radium therapy, the aftercare, and the compilation of the results in our cases. Dr. W. H. Meyer, in charge of the department of röntgenology, has had control of this phase of our work. Both Dr. Willis and Dr. Meyer have been most conscientious coworkers and have made it possible to do this team work. Our thought was the possibility of giving to the patient and to radium a scientific standing, and now that nearly a year has passed I feel that the results warrant my bringing the facts to the attention of the profession for discussion and to stimulate other endoscopists to carry on and suggest modifications.

I cannot pass to the use of radium without a reference to the transthoracic operation for the cure of cancer of the esophagus, which is to my mind one of the most remarkable in the field of surgery. It was my good fortune to witness this operation as performed by Dr. Howard Lilienthal on a patient in Bellevue Hospital about a year ago, the surgery and skill of the operator being most brilliant. The result in this case was death. As far as I am able to learn the only cure credited to this operation is the case of Dr. Torek, who only a few weeks ago told me that the patient was living and enjoying good health, seven years having elapsed since the operation. It is well to remember that no transthoracic operation should be attempted until a specimen has been removed by esophagoscopy for pathological examination.

The results of the use of radium, with a rather indefinite technic was reported by Abbe (3) in 1914.

This covered work beginning in 1905, 750 cases in all being treated, which included 150 carcinomata of the tongue, larynx, and esophagus; the results were reported as excellent. Many patients had remained free from recurrences over several years and others showed remarkable improvement. Jackson (12) devotes considerable space in his book to cancerous growths of the esophagus. Note is made of his experience that the growths are usually single (which has also been my experience), and the importance of exercising care in passing the esophagoscope in these cases is emphasized. He has used radium, but does not appear to favor its use in operative cases. Relief has been given in the inoperable cases. Special reference is made to the necessity for direct application of the radium to the growth and to note the position of the radium tube by the fluoroscopic screen but evidently not carried out in his cases. The schematic representation of a radium capsule in the centre of an annular esophageal cancer is undoubtedly the ideal method and one we have attempted in our work.

We note other references to the use of radium and especially the technic followed by various authors. In 1914, Lewin (4) reports twenty-five cases with successful results, subjective symptoms, such as stenosis, improving in a short time. The radium or mesothorium was placed in a platinum or gold filter and covered with hard rubber; dose fifty to eighty mg.; exposure two to four hours, two or three times weekly for about five weeks. The radium tube was introduced by means of a hollow tube. No reference is made to an exact method of locating the radium other than the fact that it was held in place by a slender bougie. Further encouragement is given by the report of a case by Portis (5) in 1919 in which great improvement was noted in a case of squamous celled carcinoma where sixty mg. of radium were introduced into the stricture for two and a half hours. No details were given. Most interesting also were the cases of Pinch (7) from the Radium Institute of London, who considered that symptomatic treatment was better than gastrostomy, a patient taking food nearly to the end and being comfortable. Pinch (7) tabulates his cases in the years 1914, 1915, 1917, and 1918. In all he treated twenty-five cases of cancer of the esophagus, with the following results:

Improved, three; unimproved, five; dead, nine; abandoned treatment, three; results not noted, five.

The work in France has been taken up by Tuffier (8) who notes a case examined by the esophagoscope in which a diagnosis of malignancy was made. Direct application of the radium was impossible through the esophagoscope owing to extensive edematous inflammation. Gastrostomy was performed and when the patient had improved, the neoplasm was attacked by the transpleural route. The details are most interesting. It was possible to place a tube of radium emanation equalling one mc. in twelve hours against the growth for twelve hours. In this case Tuffier hopes, from the improvement noted in the growth, to continue treatments by the natural routes. This case is mentioned to show the resourcefulness of the worker and the improvement in what seemed to be a hopeless case.

*Read at the third annual meeting of the Association of American Peroral Endoscopists, at Boston, Mass., on June 1, 1920.

I cannot take up my personal work without referring to Dr. Janeway's book on *Radium Therapy in Cancer* (11). In addition to his work in radium Dr. Janeway is active in the work of direct examination of the esophagus and stomach. The cases reported in 1917 included twenty-two of esophageal growths; only one complete retrogression can be assumed. This patient, I am advised, was alive on May 6, 1920. The first treatment was given in June, 1916. Five other patients, now dead, were definitely improved; fifteen others were unimproved. His failures he considered due to the large size of the growth and the too frequent repetition of treatment. I am advised that Dr. Zwick, Dr. Janeway's assistant, states that the last year's work is much more encouraging, but that cases are too recent for one to give a positive report. Reports have been made recently by Japanese (9) and Spanish investigators (10), but it was impossible for me to obtain translations in time for this report. In February, 1920, Dufourmental (13), Paris, reported most encouragingly, noting cases in which the patients had been relieved from pain, swallowing had improved, and there had been a gain in weight. Patients had survived for more than eighteen months to three years.

As we read the various reports and note the therapy outlined it may seem that we are not presenting any new facts, yet I feel the corollary of our method of procedure has been an advance in the technic of the treatment of esophageal cancer by radium and that these very points may have been the cause of failures. Surely no one will doubt the results in the use of radium in cancerous growths involving the mucous membrane in accessible parts of the body. It must also be noted that unfortunately the esophageal growths are not productive of symptoms in the early stage of the disease and hence not discovered by the patient until the really grave symptoms become apparent and the disease has progressed to an almost inoperable stage. The operation by the transthoracic route in addition to its gravity, has as noted previously, only one living patient to testify to its merit. It does seem to me that it is our duty, in which we should be encouraged, to add to the details in the technic of radium treatment of this disease and not be discouraged in our work if we do not accomplish brilliant results at first.

In detail, our work has consisted of a full history with complete physical examination as well as blood tests. This is followed by a fluoroscopic examination of the esophagus using the barium salts as well as an x ray plate. With these data before us an examination of the esophagus is made in the operating room, usually under local anesthesia, using the Jackson esophageal speculum for the upper portion of the tube and the seven mm. or ten mm. esophagoscope to continue the examination downward. An attempt is made to note the local conditions. The placing of the radium tube in position has been the next problem; this has not always been easy. The radium tube to which a silk thread is attached is passed down through and out the lower end of the esophagoscope and held there by forceps while the esophagoscope is gently withdrawn a

short distance. Our idea has been to place the radium tube in the centre of the growth. The esophagoscope is then withdrawn completely. The silk thread prevents the radium tube advancing further downward by its attachment to a strip of adhesive plaster, which is in turn attached to the cheek. The patient is immediately taken to the x ray room where a fluoroscopic examination is made and usually a plate is developed at once. Should the placing of the radium tube have been faulty it is immediately removed and the operation repeated in forty-eight hours. The amount of radium is 25.5 mg. of a bromide salt. The tube is screened with .1 mm. gold and to absorb the irritating secondary rays about two mm. of pure Para rubber is used as a cover to the tube, which is usually left in place for twenty-four hours. The reapplications are made not oftener than once in three weeks. The blood picture is noted in this period. We are not in a position to claim cures, for our working time has been short, but we do feel that we have obtained symptomatic relief in all our cases and have added to the comfort and morale of our patients. The following is a brief summary of our cases: We have treated six cases of malignant disease of the esophagus, and the death of one patient is noted, hemorrhage being the cause of death.

[Since this paper was written the use of the radium tube has been abandoned and the radium needles substituted.—Author.]

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Retroperitoneal Liposarcoma.—Edwin F. Hirsch and H. Gideon Wells (*American Journal of the Medical Sciences*, March, 1920) report the microscopical and chemical examination of a retroperitoneal liposarcoma without myxomatous elements, weighing sixty-nine pounds. It illustrated the capacity of malignant tumors to store up protein and fat, despite extreme emaciation of the patient.

TREATMENT OF ARTERIAL HYPERTENSION.

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Arterial hypertension is a subject about which much has been written in past years, as to the etiology, pathogenesis, and treatment. In spite of all that has been written and despite the facility with which medical men are accustomed to manage cases of hypertension, several new methods of treating this condition have appeared in the past two years and it is these newer methods that I wish to accentuate. First, however, it might be well to describe briefly just what we understand by hypertension, to present a general outline of the treatment for such high pressure, and then to discuss the more recent therapeutic innovations in the management of these cases, namely, benzyl benzoate and the restriction of salt and water intake.

Hypertension for which there is no obvious cause is a symptom, not a disease, and yet it is a symptom which is so closely related to disease that it is not amiss to treat the symptom, though as a general rule it is wise to observe the well known dictum "treat the disease and not the symptoms." A high pressure, though merely a manifestation of some underlying pathological process, is so frequently the main symptom and the cause of so many closely related symptoms that it has come to be regarded as a definite entity, no matter whether the increased blood pressure is the result of a nephropathy, an endocrine dystrophy, or a narrowing of the smaller elements of the blood vascular tree. Furthermore, by the ordinary clinical and laboratory tests, with which we are acquainted, in many cases of high pressure we are unable to demonstrate renal changes, internal secretory disorders, or other causes to explain the pathogenesis of the condition of high pressure. We are accustomed to assume in such cases that there is present a glomerular nephritis or a renal sclerosis, yet we are unable to show any distinct evidence of kidney pathology. This absence of symptoms and signs, except these referable to the high pressure, has led to a variety of names being applied to the syndrome. Janeway, because of the frequency with which such patients died a cardiac death, has labelled the disorder cardiovascular hypertensive disease. Allbutt has applied the term hyperpiesis to a group of cases in which elevation of the blood pressure is rather sudden and associated with many symptoms. Essential hypertension is the name most frequently applied to the disorder.

From this brief preliminary discussion of high blood pressure we may say that by essential hypertension we understand a condition of continuous high blood pressure, systolic pressure over 175 mm. of mercury, of unexplained cause. The patient may have many symptoms referable to the high pressure, yet on the other hand a high pressure may exist without symptoms and only be discovered accidentally when making a routine sphygmomanometer examination. Individuals of this latter type are not truly patients, yet the increasing incidence of disability and death from the results of high pressure and the likelihood of such

events taking place within a comparatively short time in the life cycle make such a person a patient, one who requires treatment. He is objectively though not subjectively sick.

General treatment.—In the management of cases of hypertension it must not be forgotten that the hypertension is a compensatory process and that any efforts to reduce suddenly the pressure by drugs, bleeding, and so on should be avoided, unless there is a threatened apoplexy or some such catastrophe imminent. Active measures are to be avoided unless absolutely necessary, and the pressure should be reduced slowly. Fortunately, Nature in her kindness has so ordained things that it is extremely difficult to reduce pressure at any time and more than difficult to reduce it suddenly. This is indeed a blessing for many are the attempts to lower suddenly a high pressure where success would lead to cardiac failure or to uremia. But in most cases the gradual reduction of the pressure is distinctly indicated, if for no other reason than to relieve the heart of a tremendous amount of unnecessary and harmful work.

Diet.—The first step, and probably the most important in the handling of these cases, is the correction of faulty habits of life and notably the correction of the more than probable abuse of food. Overeating is to be avoided. Probably overeating has induced high pressure more frequently than any other single cause. Food should be taken at regular hours, eaten slowly, and should be followed by a short rest of fifteen or twenty minutes, as the pressure rises during and immediately after eating. Alcohol should be avoided and tobacco should be used moderately. The protein foods should be eliminated from the diet to a great extent. Animal foods form the great bulk of the proteins and it is these foods that should be restricted. Fish, white meats, and eggs are as culpable as the long condemned red meats in the production of harmful nitrogenous waste products, so it is of little value to tell the patient to reduce one type of protein while he is given tacit permission to go as far as he likes with other types. One small slice of meat a day should suffice the patient suffering from hypertension. Milk also should be taken moderately in chronic cases, whereas using it as a food alone, one thousand c.c. a day for several days, will reduce a pressure which has been found resistant to all other means.

Physical effort.—Excessive physical effort is to be avoided, by all means. Work should be much restricted and outdoor recreations should not be too strenuous. A certain amount of physical effort and exercise is advisable, however, as it aids the proper elimination of toxic waste products and brings about a healthy metabolic increase. Sudden severe violent physical effort is especially to be warned against.

Hurry, worry, and mental strain.—The patient with high tension should avoid mental stress and strain. The hurry of present day life, the worry incidental to so many diverse factors in business, and the mental strain accompanying such hurry and worry are distinctly to be avoided. The hypertensive patient should cultivate a calm, lethargic mien, if possible.

Sleep and rest.—During sleep the pressure falls most decidedly and the same applies to absolute rest in the recumbent position. The patient, therefore, should be instructed by the physician to obtain a good night's rest and when insomnia prevents this, some of the mild sedatives should be prescribed.

Elimination.—In these cases the bowels should be kept well open. One or two good loose movements a day should be secured by a morning saline purge and once or twice a week calomel or blue mass should be taken, or the mercurial may be taken when the symptoms of hypertension are particularly annoying.

Hydrotherapy.—It is my custom to order for my patients electric cabinet baths twice a week. In my dispensary patients this is obtained in the hydrotherapeutic department of the University Hospital. Elimination through the skin may be aided further when it is impossible to get the cabinet baths by having the patient take Turkish baths once or twice a week and follow this with mild exercise. When hydrotherapy of this type is unobtainable I recommend a prolonged warm bath for fifteen minutes at a temperature of 103° F.

Drugs.—It has been shown conclusively that drugs are of little value in combating high pressure over any length of time. The iodides are of value only in syphilitic cases. The nitrites produce a temporary fall in pressure only and a tolerance to them quickly follows their prolonged use. They should be reserved for emergencies. Radium charged water has not been followed by any particular action, as far as I could determine in the few cases in which I have employed it. Of the newer drugs benzyl benzoate has received particular attention as a reducer of blood pressure.

This drug was introduced by Macht in 1918 and came into general use in the fall of 1919. Benzyl benzoate is one of the so-called minor alkaloids of opium and was isolated by Macht during the course of his study of these alkaloids. He discovered that these preparations have a marked relaxing action on the unstriated muscles of the body and are capable of relieving spasm of such muscle. On account of this antispasmodic and tonus lowering effect Macht had the drug tried out in a variety of conditions which are associated with muscular spasm. He asserts that he received good results in relieving the following spasmodic conditions: Diarrhea and dysentery, intestinal colic and enterospasm, pylorospasm, spastic constipation, biliary colic, ureteral colic, vesical spasm, spasmodic pains in seminal vesicles, uterine colic, bronchial asthma, and arterial spasm hypertension.

It is with this last condition that we are particularly interested today and I will recount to you my rather brief experience. In a small series of six cases I religiously gave the drug for some weeks. In order to test it out I used but few auxiliary methods but rather made an effort to see if the benzyl benzoate, plus a few simple general hygienic directions, would lower the pressure. In no case did I see any effect from it whatsoever. Likewise I have talked with some of my colleagues and they have been almost unanimous in expressing the

opinion that it has but little effect on the blood pressure.

While I have seen little if any result from the administration of benzyl benzoate in the treatment of increased blood pressure I have had the opportunity of testing it in two cases of angina pectoris and can testify as to its value in this condition. Likewise in several other painful or disagreeable spastic conditions its action has been truly remarkable.

Reduction of salt and water intake.—Some months ago Dr. F. M. Allen published an article (1) on arterial hypertension in which he advocated the reduction of water intake and the elimination of salt in the treatment of hypertensive cases. Allen's thesis is that in many cases high pressure is a compensating process in which the elevated pressure is necessary "to force a filtrate of water and dissolved substances through a damaged and partially blocked glomerular filter." His theory, while not a new one, has never received much attention in this country or Germany, though to a certain extent the French school has recognized the coexistence of high pressure and salt retention. Allen shows by his results that there is a very definite relation between salt retention, large water intake, and high pressure. To determine the value of this procedure we have observed, in the medical dispensary of the University Hospital, the effect of the lowering of salt and water intake upon patients with arterial hypertension, not caused by obvious renal disease. Likewise in three private cases I have had the opportunity of watching the effect of this treatment upon the blood pressure. Though there are only seven cases to report upon and it is unwise to draw deductions from this small series, nevertheless as the results were so uniform, it does not seem unfair to present them.

	BLOOD PRESSURE.			
	Before Treatment Systolic	Diastolic	After Treatment Systolic	Diastolic
Case I.	185	85	125	75
Case II.	215	105	170	85
Case III.	157	79	130	80
Case IV.	204	115	170	105
Case V.	205	120	160	100
Case VI.	174	80	145	75
Case VII.	230	110	210	100

In the dispensary cases studied by Dr. Robert McMillan repeated examinations were made of the blood urea, plasma chlorides, and phenolphthalein elimination. He found that the plasma chlorides were raised before reducing the salt intake and that the reduction in chlorides was commensurate with the lowering of the salt intake. Likewise the height of the pressure had a fairly definite relation to the plasma chloride fall. In order to illustrate more satisfactorily the result of this treatment I will recount briefly the history of a patient I have treated with potassium iodide and sajodin, and subsequently placed upon a modified restricted salt free diet.

CASE.—Mrs. M., aged fifty-three, widow. Patient referred on account of gastric symptoms. Except for the gastric symptoms, ringing in the ears, nycturia once a night, and an intermittent heart, she had no other complaints. There was no edema nor dyspnea. In her past history there was noted eclampsia sixteen years ago and hysterectomy nine years ago. The family history showed that her

mother had died of apoplexy at the age of seventy-one, and one brother of nephritis and apoplexy at fifty-six.

Examination showed a rather well nourished female; eyes, teeth, tonsils, and thyroid negative; lungs clear; heart enlarged down and left. There was heard a presystolic mitral murmur, a much accentuated aortic second sound, and an occasional extrasystole. Abdominal examination showed nothing but a slight ptosis of the stomach. The gastric examination showed a marked subacidity. The urine in repeated tests showed a specific gravity varying from 1008 to 1024. Occasionally a trace of albumin was found. The preliminary blood pressure was 205-120, the hemoglobin ninety per cent. The eye grounds were negative.

The patient was ordered sodium phosphate daily, prolonged warm baths twice a week, a low protein diet, and was given general directions as to daily hygiene. In a short time iodide of potassium was ordered and subsequently sajodin. For a month the pressure ranged between 205-190 systolic, 120-110 diastolic. At the end of this time, when the pressure was 205-115, the patient was suffering very much from dizziness and tinnitus. She was ordered to cut out salt from her dietary and restrict water to 800 c.c. a day. Eight days later the pressure was 185-105; in nine subsequent examinations it had fallen steadily until at the present time it is 160-100. The patient is now practically free from symptoms and is apparently in good general condition.

There are several minor observations I would like to make upon this phase of the treatment of hypertension. If a reduction in salt intake is ordered, the need of the organism for water for the purpose of diluting the increased chlorides retained in the body is not pronounced. Therefore, with the reduction in the salt the desire for water is decreased and the water intake is almost automatically diminished. The estimation of the plasma chlorides gives positive evidence of the reduction of these salts which is confirmed by the blood pressure observations. While the plasma chloride estimation is of great value and should be used whenever possible in treating the hypertension patients, nevertheless the parallelism of the reduction of the pressure and the chlorides is so close that by simply following the blood pressure a fairly accurate idea may be attained as to the actual reduction of the plasma chlorides when laboratory facilities are lacking. Lastly, it must not be supposed that all cases respond to this form of treatment, as, for example, Case VII in the table.

CONCLUSION.

The management of a case of hypertension requires a careful study of the patient. Unless some threatened vascular cardiac or renal catastrophe seems imminent physical and hygienic measures should be relied upon more than drugs. The reduction of salt and water intake forms a valuable adjuvant to these measures.

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WHAT IS DISEASE?

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In a work on pathology, health is defined as "that condition of function and structure which we find to be normal," and disease is defined as "any departure from the normal standard of structure or function of tissue or organ." At the same time the "normal" is defined as that which "we find to be the commonest." In other words, the average of function and structure is taken as the normal, and any departure from that average is designated as disease. Under that definition, the champion pugilist, the champion wrestler, and the champion oarsman would be diseased men. The champion trotter would be a diseased horse, and the dairyman who kept specially good milkers should be prosecuted for selling milk from diseased cows. And men with such robust intellects as Newton, Franklin and Edison must have diseased brains. At some time in the past, man's ancestor was much more apelike than manlike, and to get human beings from such ancestors there must have been departures "from the normal standard of structure and function." Under the definitions quoted, the entire human race must be a diseased product. And what is more, evolution must be a disease.

The object here is to present a new definition for disease, and to indicate some of the reasons why it is thought that this new definition is superior to the old. This new definition will include among diseases some things not now considered as disease at all, and perhaps will exclude as not being disease some things now considered as disease. The real object of presenting the new definition is to cause disease to be looked at from a new angle, and such new view will be instructive even if the reader does not agree that the definition is of the proper scope. As a convenient procedure, the definition will be given first and the argument later.

Disease is the effect produced upon certain cells or organs by a continued overload, which, if not interrupted, results in the death of the cells or organs. The term disease might, with propriety, be used to represent both the overload and the result produced by the overload. It might also be used to represent the process by which an overload destroys life. In this last meaning, the definition would be reduced to the epigrammatic form

DISEASE IS THE ROAD TO DEATH

Under these definitions, nothing could be called disease unless it led toward death, either of the individual, or of certain cells or organs in the individual. A mere stress or strain which caused pain and abnormal action within an organ would not be disease unless the magnitude of the stress or strain were sufficient, if continued, to cause the death of some of the cells within the organ. A deformity, while it might be the product of a disease, would not be a disease itself unless it were of a kind which would necessarily cause death. In such a case, the deformity would be the overload. Or a deformity plus something else might amount to an overload, in which case the deformity would be a part of it.

Let us suppose that I should stab a man in the arm, or leg, or back, and he should lose considerable blood before the flow could be stopped. He would be weakened by the loss of blood. Suppose that the next day, before he had been able to recover from the loss he suffered, I should stab him again, and he should lose still more blood. Suppose further that day after day I should stab him in the same way and that day after day he became weaker and weaker until he finally died. No one would say that the man died as the result of disease.

Suppose that a man traveling in a tropical jungle should find leeches so numerous that he was unable to protect himself, and that day after day they drew so much blood from him that he finally died. This is not disease under the ordinary meaning of that term. But let us suppose that unknown microorganisms cause increased destruction of blood corpuscles day after day until the man dies of anemia. That is disease.

Wherein do these things differ in their essence? In each case the man dies from blood losses day after day. Are we to use the term disease to represent only the mysterious and the unknown? Small leeches taken in drinking water sometimes attach themselves to the fauces, and the effects produced have been mistaken for disease. Does a disease cease to be a disease as soon as we understand it?

Suppose that a man is bitten by scorpions or by tarantulas, or is stung by bees, wasps or hornets until he becomes seriously ill as the result of the poison injected into him. No one says that such illness is due to disease. If a man is similarly poisoned by typhoid or pneumonia or other germs, that surely is disease, but wherein is the difference? Is the first not a disease because it is by some familiar insect, and the latter a disease because it is by some unfamiliar bacterium? Is the question of disease and not disease to be determined by the factory in which the poison is manufactured rather than by the nature of the poison and the effect it produces?

In several cases it has been discovered that stags, in fighting, have got their antlers locked together and have died in this condition. We can picture the combat with the horns locked. The deer can struggle only by pushing and pulling and twisting. They cannot produce any wounds upon each other. But in that pushing and pulling and twisting they wear themselves out and finally fall down and die from sheer exhaustion. Did those animals die as the result of disease?

When a person is worn down or exhausted from long continued physical exertions he is much more susceptible to bacterial infection than when not so exhausted. Also, after a man has been through a long illness due to some bacterial infection, he is worn out and weak. These are facts which show that the same energy used in a physical struggle is the energy used in fighting bacterial infection. The burden thrown upon a man's powers by bacterial infection is called disease, but the similar burden thrown on the same powers by an opponent or by some physically observed and fully understood circumstances is not disease. But wherein is the difference? In both cases the physical powers are ex-

hausted by efforts which expend energy of the same kind. Does a disease cease to be a disease when the millions of cells which a man fights are organized into large bodies instead of being separate entities?

We can convert work fully and completely into heat, but we can make the reverse transformation only in part. As a consequence, heat is called the degraded form of energy, and is always a product of work performed. When a person takes violent exercise, as in a foot race or a wrestling match, his temperature increases and may rise to 105° F., or more, and such appearance of extra heat is evidence of the exertion he makes. A fever represents an increase in the heat form of energy and is evidence of a physical struggle of some kind which is invisible because it is within the body. The invisible struggle which produces a fever is said to be disease, and the visible struggle of a foot race which correspondingly raises temperature is not disease. Is a question of disease to turn upon the degrees of visibility? Is a bacterium to be considered as the cause of disease because he can be seen only with a microscope, and an opponent in a wrestling match not the cause of disease because he can be seen with the naked eye?

When a man swings Indian clubs or dumbbells he exercises certain muscles and expends certain foot pounds of energy. As the swinging continues, he gradually becomes tired and has to stop for a rest. After resting for a few minutes he can resume his exercise, but soon becomes tired and must rest a second time. After another short rest he can begin the exercise a third time, and so on time after time for perhaps several hours. Each period in which the man was taking this exercise consumed the available energy in the muscles being exercised, and during each period of rest the supply in the exercised muscles was partially replenished by drawing upon the store existing at the time in other organs.

The fact that severely exercised muscles in the arms may draw upon the reserves in unexercised parts of the body is evident from the fact that a person who has become tired by swinging dumbbells is in no condition to compete in a foot race or in a debating contest. Each organ has in it a store of energy normally appropriated for the use of that organ, but in emergency, a severely taxed organ may draw upon the supplies in other organs. An organ so taxed is suffering from an overload during the time when the efforts are continued. But if the man rests until the next day, or for a period long enough for his system to get back into the organs from the food supply the amount equal to that expended, then there is no overload when the efforts are measured in the longer period. The overload was interrupted by the rest. If not interrupted, then the man would ultimately die from exhaustion as in the case of the deer with locked horns.

When a man goes into a gymnasium or out onto a golf course and takes more exercise than has been customary or habitual with him, but an amount which is less than an overload when the resting time is counted with the exercising time, he builds up the energy supply in the exercised organs to something

greater than it was before. If he begins such exercise comparatively early in life and keeps it up regularly, he may develop his powers to something much in excess of anything he inherited. Examples of such development may be seen in the trotting horse. In the evolution of the two minute trotter from stock not capable of trotting a mile in three minutes, many thousands of the horses trained and raced have developed trotting powers much in excess of anything which ever existed in any ancestor. In this connection the reader should remember that the run is the natural high speed gait for the horse, and that high speed at the trot is an artificial product of the nineteenth century.

The reverse of the development of powers by exercise is the degeneration of powers by idleness—the term idleness meaning an amount of exercise to the unit of time which is somewhat less than has been habitual. In previous articles (1) I have given many examples of the development of powers by exercise and the degeneracy of powers by idleness in animals, plants, bacteria and protozoa. A few more examples will be given here.

Pasteur found that the anthrax bacillus could be raised on an artificial medium, as bouillon at blood temperature. When so raised the bacilli do not have to fight for life in a hostile blood reaction, and because they do not have to fight they gradually lose their power of fighting, which is their virulence. He used two cultures, a very weak one produced by a long period of idleness in life on artificial food, and one not so weak produced by a shorter period of idleness. He then inoculated an ox with the weaker culture, and twelve days later with the stronger culture. An animal so inoculated was immune to fully virulent virus. Here we have the progressive decay of powers in the bacilli by idleness, and the progressive development of powers in the ox by exercise.

But Pasteur's experiments went still further in this matter. By long cultivation on artificial food he got anthrax germs so weak from the lack of exercise in fighting for food that they were unable to survive even in a mouse. But by taking such weak virus and inoculating a very feeble animal, as a guineapig a day old, and then passing it along by inoculation to stronger and stronger animals, he found that the strength of the virus was built up step by step with each inoculation until it was powerful enough to attack the strongest animals. Here we have a case of absolute control over the gain and loss of powers in the same organism by controlling the amount of its exercise.

Haffkine made similar experiments with the cholera vibrio. This is a motile organism, the virulence of which seems to be directly proportional to its power of movement. He found that, for the two inoculations he wanted to make to produce immunity, the germs obtained from the intestinal canal were too powerful for the preliminary inoculation, but not sufficiently active for the second, if marked protection was to be obtained. He also found that by growing this germ on agar, or other nutrient media, it gradually lost its activity and virulence, and he could thus get a weak form suitable for the first inoculation. Also, he found that

by passing germs from the original stock through "a series of about thirty guineapigs" he got a virus of "great activity."

Here we have a case of producing two strains of microorganisms from the same stock—one a weak strain which gradually lost its powers because it did not have to exert itself by a struggle for existence in a hostile environment, and the other a superpowerful strain which became such by being compelled continually to exert itself by passing from hostile environment to hostile environment for about thirty times. These two strains formed the weak and strong vaccines which he used successfully to make guineapigs immune against doses of cholera poison from eight to ten times the normal lethal dose. But he found one thing more. He found that after he had got the powerful culture he must maintain it by the process by which he obtained it. On agar, the powerful germs soon lost their activity, and it was necessary, from time to time, to pass them again through a series of guineapigs.

Without multiplying examples of cases in which the powers of living organisms have been increased or decreased at will by causing those organisms to either exercise or fail to exercise the powers they have at the time, we may consider what overload is in bacteria. When Pasteur got anthrax virus so weak that it could not survive in the blood of a guineapig a month old, the powers of the guineapig were an overload for those germs. But when he came down to something as feeble as a guineapig a day old, then those weak germs were an overload for that young guineapig.

Now the difference between a guineapig a day old and a guineapig a month old is a difference in physical powers developed by normal activity in the interval between a day and a month, and not a difference in inheritance. Guineapigs do not do any inheriting after they are born. A load is measured by the powers necessary to carry it, and as powers increase or decrease in accordance with the extent to which they are exercised, it is evident that what may be an overload at one time may not be an overload at another. Also, powers may be decreased by simply shutting off the power supply, in which case a load which was less than an overload might become an overload. For example, a load which a person could carry with ease and not even be aware of its presence might become an overload by reason of an insufficient supply of food, or of some ingredient of food. An animal weakened by starvation is more than normally likely to fall a victim of some disease.

If a man exercises the muscles of his arms and not the muscles of his legs, his powers are developed in his arms and not in his legs. If his work is mental exercise and not physical exercise, then powers are built up in the brain and not in the muscles. If a man begins by taking small doses of arsenic and later becomes an arsenic eater, he develops his powers of resisting arsenic and not those of resisting opium or some other drugs. When a person is vaccinated his powers of resisting smallpox are developed and not those of resisting pneumonia or some other disease. And so on.

While these things are relatively true, they are not absolutely true. When any kind of powers develop in a person by exercise without at the same time permitting some other powers to decline by idleness, the total powers in his organism are increased, and the total supply may be called on for assistance when some particular organ is overloaded. This is illustrated in the case of the dumb-bell exercise previously given. It is further illustrated in the case of snake venom, for which no animal has normally developed a specific resistance. But by beginning with small doses insufficient to cause death, and then gradually increasing them, a few doses have been sufficient to enable an animal to withstand, without harm, a dose fifty times as great as would have been fatal in the first instance. Such great development of some specific power in a short time can be obtained only by the conversion of some powers already within the system.

If a man is attacked by smallpox or pneumonia or other equally dangerous ailment, and then recovers, is the attack a disease within the definition here given?

Yes. It is a case of an overload which was continued for a time but failed to produce death because it was interrupted. The fact that there was an attack which caused distress is evidence of an overload. A load which is carried easily is not an overload. For example, the heart carries a load from birth to old age without difficulty or distress, but let there be a considerable increase of blood pressure, and the load becomes an overload. An attack of smallpox is possible only because the system does not have in it enough of that specific form of power which resists this kind of germ. In attempting to meet this form of attack the system builds up its resisting powers by exercising them and by calling on other powers for help. When these resisting powers become greater than the powers of attack, the overload passes from the man to the germ, and the germ not having outside powers it can call upon for help is quickly destroyed, and the man becomes convalescent. In this proceeding the man's resisting powers have become very great at the expense of other powers, as is evident from the fact that a convalescing man is physically weak.

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Study of Wound Healing in the Rat.—Hachiro Akaiwa (*Journal of Medical Research*, September, 1919) studied wounds of various kinds in the skin of the ears of rats, produced with trocars or razors. A detailed description of the results obtained is given. Among the conclusions arrived at by Akaiwa are the following: The shallower the wounds, the more rapidly the new epidermis enlarges, which is due to the smooth wound surface, over which the epithelium moves with little resistance. The larger the wound the more rapidly the new epidermis enlarges, so that larger wounds close relatively more rapidly than smaller ones, and shallow wounds more quickly than deep ones.

THE DOCTOR AND THE NEUROPATH.

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Various comments which my colleagues have made with reference to hysterical and neurasthenic patients, as well as an experience with a multitude of such patients who have gone the rounds, are some of the reasons why I have chosen this subject. A remark not infrequently heard is something like this: "I do not know a thing about nervous diseases," and then there is often added, as if in self-defense—"And I am rather glad of it."

If I were a Freudian, I would be inclined to consider such expressions on the part of my confrères as symptomatic of past embarrassing and unsatisfactory experiences with these patients which they have endeavored to bury in their unconsciousness but which from time to time tend to symbolize themselves in this manner.

This reaction of the doctor to the type of patient described is not without its justification from his viewpoint. In his examination of them they had passed the acid test. Their temperature, pulse, blood pressure and urine examinations were normal. The bismuth meal and fluoroscope examination showed that their gastrointestinal tract was performing normally. The absence of anything definite or positive in either their physical or laboratory findings forced the doctor to the conclusion that these patients, for whose numerous and diverse symptoms he could find no adequate or tangible explanation, which often increased rather than decreased under his ministrations, were simply victims of their own imagination and that nothing really ailed them anyway. In the end he usually dismissed them with the parting injunction to "go home and forget it."

During my early days of practice, the term neuropath was neither as much in vogue or as well understood as it is now. Neurasthenic and neurasthenia were the expressions used in referring to the functional nervous type of patient. The rest cure of Weir Mitchell was then at the height of its popularity with the nerve specialists as a successful means of treating these cases. The neurologist in making use of the rest cure was carrying out a logical method of therapy according to the understanding which he had at that time of his patient's malady. The best conception of neurasthenia was that of a nervous exhaustion—pure and simple. The state of mind, the attitude of the patient himself, as an important contributing factor in the causation of his symptomatology received little or no consideration.

When we reflect on this conception of neurasthenia and the manner of treating it by the neurologist, we must admit that at this time he had little to boast of in his methods over those of his medical colleagues—the surgeon and the internist. The improvement observed in so many cases by patients who had taken the rest cure was also noted by the surgeon after many of his operations, testified to by thousands who had drunk of the waters of Lourdes, gazed reverently on one of the bones of St. Anne, experienced the laying on of hands of magnetic healers, worn electric belts and undergone numerous

other both mystic and mysterious procedures. Their faith, if it had not made them entirely whole, had worked wonders for them. Autosuggestion and heterosuggestion were chiefly responsible for their improvement.

The neurasthenic has always been a *bête noir* to the medical man. He can point with pride to his progress and accomplishment in almost all other directions but at the feet of the neurasthenic he is compelled to acknowledge his Waterloo.

What may be considered as a rational explanation of this thus far baffling patient? In regard to his etiology, we realize more clearly than formerly that the neuropath, like the poet, is more often born than made. We see in him an individual with a nervous diathesis, which is inherited and inherent, just as truly as the diathesis of the patient of whom we speak as being rheumatic, hemorrhagic, gouty or strumous. We also recognize that the neuropath is closely akin in the genesis of his condition to a large number of other mental and nervous diseases also called functional in origin—as for example, migraine, epilepsy, dipsomania, angioneurotic edema and the various psychoses.

Often one of these other conditions, such as migraine, is found in the neuropathic individual as a further proof of his nervous dyscrasia and complicates his neurasthenic symptoms. The affections which I have just mentioned are regarded as both physiological and psychic stigmata of this nervous diathesis and may be considered as interchangeable with one another either in the same individual or more especially some member of his family. As illustrative of this, the father of a neuropath, instead of being, strictly speaking, a neuropath himself, may have exhibited this predisposition as a dipsomaniac. A neuropathic mother may have passed on her nervous dyscrasia to some one of her offspring in the form of an epilepsy and so on. All these types of functional nervous affections have been classified under one great group, called the psychoneuroses. The important thing which I wish to emphasize in the consideration of the neuropath is that fundamentally and physiologically he differs from the normal individual and in judging him in a spirit of fairness and also from the viewpoint of his welfare, his past is just about as pertinent as his present. He has an inherited tendency to neurasthenia and so called neurasthenic symptoms which the normal person does not have, or if he has, not to what may be called the pathological degree of the neuropath. Such stigmata as he exhibits, such as migraine, irritability of the vasomotor system, as seen in the rapidity of his heart beat, the coldness and clamminess of his extremities, together with the tendency to redness and cyanosis of his hands and feet, the nervous tremor when excited, as well as his attacks of angioneurotic edema and other manifestations of this nature, must be considered, as physiological. They are all symptoms which must be attributed directly to the sympathetic nervous system which not only furnishes the nervous mechanism for the regulation of the vasomotor system but also supplies all of the smooth muscle of the gastrointestinal tract and the glandular structures performing the secreting and excreting func-

tions of the body of which the endocrine system is a part. When a sympathetic nervous system acts so abnormally in its visible functions, is it not reasonable to suppose that abnormalities in function exist also in its other activities, such as the maintaining of normal contraction and tone in the gastrointestinal tract, as well as the normal secretions of the stomach, thyroid, suprarenals, ovaries and testicles?

In the clinical manifestations of our nervous patients we are continually observing disturbances of function of this sympathetic neuroglandular mechanism, not only in the vasomotor system but also in all of its other activities. Digestion is often disturbed as is evidenced by the furred tongue, the formation of gas with its accompanying distention and atony, alteration in the menstrual function in the form of dysmenorrhea or amenorrhea, hyperactivity of the thyroid, with persistently increased pulse rate and the asthenic state. Definite and positive disturbances of the character just described are an integral part of the symptoms in nervous cases.

Recently I had an opportunity of observing in a case of vicious vomiting during the early months of pregnancy not only the important rôle which the ovarian function plays in the causation of such symptoms but also the influence of inheritance on this function as well. In this case, in addition to the severe vomiting, there was evidence of what may be called a hypersubjectivity, an abnormal selfconsciousness, insomnia, hysterical symptoms as manifested by alternate laughing and crying, periods of slight mental confusion, with incoherence and increased irritability. The patient's sister told me that both she and her mother had had similar symptoms in the first months of their pregnancies. The vomiting in this case became so severe that an interruption of the pregnancy was found necessary. Inside of three or four days after this had been done, most of the symptoms had passed away.

Another case in point was that of a chorea of pregnancy, chorea gravidarum, also in a young woman, at about the seventh month. In this patient, vicious vomiting had been present during the early months and when the vomiting began to subside the chorea made its appearance. In this patient the jerking movements in her face and body were something frightful to witness. At the time I saw her she was unable either to talk or eat because of them. It was thought best to resort to operative intervention at once, and so a Cæsarean section was performed by the surgeon. In spite of this severe procedure the patient showed a marked improvement inside of three days. In a week's time her choreic movements had disappeared altogether.

Ordinarily we do not have as good an opportunity of observing the influence of the sexual glands in men as we do in women but occasionally cases are encountered which show that their influence here is equally as great.

CASE I.—A young man, aged twenty-one, suffered a severe accident to his testicles, which necessitated their removal. Ten years later, besides the physical changes which, of course, were distinctly feminine in nature, he exhibited a decided love for personal

adornment—perfumes, flowers and fruits. He had spells of easily recognized periodicity, in which he felt unwell, complained of vertigo, exhaustion, headache, increased irritability and mental depression. Outside of these regularly recurring attacks, he was shy and obsessed with different phobias.

As further evidence of the apparently endogenous and idiopathic nature oftentimes of mental states, I will report the following cases:

CASE II.—A patient for many years had suffered from severe attacks of migraine at her menstrual periods which lasted for a day, beginning in the morning and terminating at night. After this patient had passed the menopause, her headaches stopped but seemingly as a transformation of these headaches, regularly, each month, she had one day of severe depression, during which she walked the floor, greatly agitated, sometimes wringing her hands, and was possessed with distressing suicidal impulses.

I recall two cases, both in women, the younger one a niece of the older, who lived in distant parts of the country from each other. Neither one had any knowledge of the nature of the sickness of the other. These patients were both subject to periodical attacks of depression, which seemed to run a definite course and in their attacks were obsessed with the same identical fears.

I relate these cases to show that in any full appreciation of the neuropath and his symptoms, both physical and psychic, his inheritance plays a rôle by no means unimportant and is responsible for both physiological and mental symptoms which are difficult to attribute either to autosuggestion or heterosuggestion or even a pathological suggestibility.

To regard this complicated neuroglandular mechanism as the endogenous and basic factor in all those states grouped under the heading of the psychoneuroses offers, to my mind, the best working hypothesis for a rational explanation of the multitudinous phenomena which such cases exhibit.

We must reflect that the etiological factor may be and usually is a variable one in every case. On the one hand we see cases where the endogenous factors play the chief rôle, not only as in epilepsy and migraine, but also in the neurasthenic and psychic conditions. We also see cases where the physical state, as a result of a severe infection or an exhausting illness, appears to be the chief causative factor, with the endogenous and psychic influence standing in the background. On the other hand, we see cases, and perhaps the majority of them, where the mental element occupies the centre of the stage and the endogenous factors seem relatively unimportant.

In these days when the trend of medical opinion tends to attribute a psychogenetic origin to all nervous phenomena of a functional character, we will be wise if we do not permit ourselves to lose sight of the physical and physiological factors.

There is an old saying which admonishes us to pad the nerves with fat. We have always observed the bad effect of a loss in weight of ten or fifteen pounds in the individual with a nervous diathesis. As he loses his weight, pound by pound, so also he seems to lose his nervous equilibrium and vice versa—as he increases his weight, he ac-

quires nervous stability. Often a very definite relationship may be established between these two things—weight and nervous equilibrium. As a concrete example, I wish to cite the case of a young woman, who, when she weighed one hundred and twenty pounds had a severe attack of migraine once every two weeks and sometimes oftener, but two years later, weighing one hundred and sixty pounds, she rarely had these attacks, sometimes as long an interval as six months occurring between them.

Recently I had a patient, a boy, aged ten, exhibiting typical neurasthenic symptoms, following a slight attack of chorea. In this case, what may be termed the strain, the exciting cause, was insignificant. No mental element was discoverable. The patient had alternating bradycardia and tachycardia, flushing and blanching of the skin of the face and neck, cold extremities, extreme irritability when tired, was easily exhausted and slept poorly. Stories and even pictures of an excitable nature agitated him greatly. The boy was an adopted child and in addition to a bad nervous inheritance, had one testicle which was undescended, and the other was small and atrophic. In this case the endogenous factor seemed to be the chief one, the strain, the physical agent, as represented by the chorea, a minor one, while the influence of the mental state was not perceptible. It seems to me we are justified in recognizing, in such cases as this, what may be termed an endogenous neurasthenia which no doubt is similar in character to those cases which formerly were grouped under the older term of essential neurasthenia.

It is scarcely necessary to call attention to the close relationship existing between the cerebrospinal and the sympathetic nervous systems. We have all experienced ourselves and also been witnesses of this fact many times. In some this relationship seems more delicate, more responsive, more sensitive than in others. In some it is much easier for the state of mind to disturb the normal function of the sympathetic than it is in others, as evidenced by the quickened pulse rate to the least excitement, the dryness of the tongue and mouth when in a state of fear. I think all of us can recall cases of sudden cessation of the menses produced by fright. I can remember three cases of exophthalmic goitre which developed suddenly while the patients were undergoing intense excitement. We have repeatedly seen all sorts of nervous and hysterical symptoms developed in one individual as the result of a sudden shock, while others, in the immediate vicinity, experiencing the same shock, were entirely unaffected. This variation in influence of the cerebrospinal nervous system upon the function of the sympathetic nervous system in different people for the sake of illustration, at least, may be referred to as a difference in contact—what Cannon has termed, a difference in threshold, or, as it were, in the degree of insulation between these two systems. This difference in contact, threshold, insulation, pathological suggestibility—or whatever you may wish to call it—may be regarded as an explanation for the various reactions of different individuals to their own environments. Why, for example, do some, under strain, break down and go to pieces

easily while others remain perfectly unaffected and indifferent through the most trying ordeals.

When one looks over the case records of his nervous patients and asks himself how many of their symptoms would still be left if it were possible to suddenly and completely strip them of all of their fears and change their mental content from that of worry and apprehension to that of hope and contentment, he feels inclined to answer—not many. Granting that it could be done, there is still good reason for thinking that it might be compared to the delousing process of the soldiers who were going back to the trenches the next day. It would soon have to be done all over again. We hear a good deal about the psychological dugouts to which our patients flee in a defensive reaction against their environment but forget to suggest that perhaps these dugouts are similar in nature to the dugouts some one of their forbears have been making use of for generations. While the mental factor in most cases is a very important one and often seems to be the chief one, it is never entirely uncomplicated. The predisposing cause, the inherited and endogenous agencies always have to be reckoned with.

The change in a patient's mental attitude may occur as suddenly and make as great a difference in his general condition as a change in the wind can make in the temperature of Minnesota when it blows from the north or south. The change in the direction of the wind is, of course, directly responsible for the change of temperature—from warm to cold and vice versa, but back of the change in the direction of the wind other forces in atmospheric conditions must be taken into consideration which are in themselves responsible for this change in the wind's direction. So also in the nervous patient, we note the marvelous effect in his symptoms, either for better or worse, apparently depending entirely on the change in his state of mind and so come to the conclusion that the origin of his trouble is wholly psychic, overlooking endogenous disturbances which are in themselves responsible largely for this change, like the atmospheric conditions in their relationship to the wind.

We have spoken frequently of the nervous symptoms of this class of patients. Properly speaking—what are some of these symptoms? I think sometimes there is a tendency to enroll all symptoms for which no satisfactory explanation can be found in this category. The subjective nature of so many of such symptoms is probably responsible for this. It would be difficult to mention all of them, but the following are the symptoms most frequently encountered in nervous cases: Headache, vertigo, restlessness, inability to concentrate, insomnia, loss of ambition, lack of interest in environment, fear and apprehension, hyperirritability, feeling of exhaustion, irritable vasomotor system, gas eructations, abdominal distention and atony, paresthesias, anesthesias, and tremors.

If we carefully investigate the nature of the headaches, for example, of which the neurasthenic complains, we will find that it is no ordinary headache, in fact, strictly speaking, it is not a headache at all in the customary sense in which this term is used. It is a feeling of pressure, a sensation as if the head was in a vise or a steel band was applied around it. If a

neurasthenic patient who complains of his head is closely questioned concerning the nature of these head sensations, it makes no difference whether he lives in St. Paul or Berlin, he will give much the same description of them, thus indicating that the headache of a nervous patient is characteristic in nature. The same thing may be said in regard to all of his other symptoms. They are remarkably similar in the different patients.

To regard these sensations, these so-called subjective symptoms of our nervous patients, as wholly imaginative in character, is only a confession on our part of our lack of a suitable explanation for them. In my opinion, these symptoms are to be regarded as toxic in origin, caused by disturbances in the metabolism of the body as a result of the disturbed functioning of the sympathetic nervous system and the glands which it activates. It is to be remembered that, in so far as the symptoms themselves are concerned, it makes little difference whether this disturbance of function is caused by congenital defects in, or degenerations produced by, disease of the glands or is due to the abnormal stimulation on the part of the sympathetic mechanism, caused by an agitated and disturbed mental state. It would be more appropriate, if instead of speaking of such symptoms as nervous, with only a vague idea of what we mean when we use this term, to speak of them as toxic symptoms of metabolic origin.

In the mental conflict of every neurasthenic and hysterical patient, fear of some kind plays a predominating rôle. It makes little difference so far as the agitation of the patient is concerned whether this fear is real or imaginary in character. If one is awakened in the night by some sound and at once jumps to the conclusion that there is a burglar in his bedroom closet, his fear is going to be just as great as if there actually were one there. If he lies still, afraid to move, his fear increased by every sound which the stillness of the night brings to his overstrained nerves, when morning comes and the daylight shows that his fears were groundless and imaginative, the exhausting effect of the strain he has undergone during the night will be just as real and positive as if a burglar had actually been there. This illustration explains the situation of so many of our nervous patients. Their fears are imaginary but the effect of these fears, because of the disturbances which these fears have caused in the functioning of the sympathetic nervous system, are real and positive. The disturbance in function caused by the cerebrospinal nervous system acting upon the sympathetic system produces changes in the metabolism of the body and these changes in the metabolism create a toxemia which is responsible for the nervous symptoms of which the patient complains.

We see this well illustrated in patients with traumatic neuroses and shell shock. In the cases of traumatic neuroses oftentimes the symptoms do not begin until after the visit of the claim agent or the employment of a lawyer. They are always worse as the date of the trial approaches caused by the increased mental strain and when their cases have finally been ended, either successfully or unsuccessfully, and the thing ceases to disturb their state of

mind, their symptoms disappear. In the shell shock cases the signing of the armistice had the same effect as the termination of litigation has in the cases of traumatic neurosis—the symptoms vanished. The removal of the conditions which were responsible for their disturbed mental state caused the disappearance of their symptoms. These two types of cases have given us a much better understanding of all cases of a similar nature.

To treat such cases intelligently, we should make every effort to ferret out the nature of the strains in the environment of these patients and remove or at least adjust them. We have been too much accustomed to seek for the causes of our patients' complaints in exogenous factors, such as physical defects and focal infections. The idea that these symptoms may be due to some terrible fear, some secret disappointment, some incompatibility in their environment, plus something endogenous and inherited in the patient himself, has not been sufficiently recognized. If we wish to recover lost prestige by our failure in the past with these cases, we must think more broadly concerning them than in terms of infections alone. To endeavor, as is often done, to make infected teeth or tonsils or any other infection as the chief etiological agent in the causation of a neurosis, a psychosis, a migraine, an epilepsy or tic douloureux, shows a woeful misconception of a large and important group of cases. We laugh at the osteopath because he claims a dislocated vertebra pressing on a nerve as the chief cause of his patient's symptomatology. We have equally as much reason for laughter at the medical man who removes tonsils or does a circumcision for the cure of epilepsy, who extracts teeth to cure a tic douloureux, who removes a nasal spur for the relief of migraine or performs a central fixation to cure a neurosis or psychosis.

In order to have the proper conception of the etiology of these cases which are grouped under the general term of psychoneuroses and to which the neuropath belongs, two factors must be carefully considered, the inherited and endogenous on the one hand, as obtained in the family and personal history of the patient and the exciting, on the other, as revealed in the various strains which it is possible to discover in his environment, not forgetting that sometimes the predisposing, sometimes the exciting cause is to be ascribed the predominating rôle. In the light of this conception of the neuropath, what can be done to benefit him? First, we must estimate, as carefully as possible, the weight of his inherited burden, then do our best to seek out the nature of the strains not only physical but also psychic, produced by the fears, the incompatibilities and obstacles which exist in his environment and which are causing his two nervous systems to make contact, to short circuit as it were, and if it is not possible to remove these strains, entirely, endeavor to adjust them so that he will be the better able to endure them.

If we strive to manage our nervous cases in this manner, we will very soon realize as a result of our success that dope and electricity, as well as focal infections, in the treatment of such cases are not the *ultima Thule* and be led to exclaim with Hamlet: "There are more things in heaven and earth, Horatio, than are dreamt of in your philosophy."

IMPAIRMENTS REGARDING FAMILY AND PERSONAL HISTORY.*

Their Expected Mortality.

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Insurance has been defined as "the institution which eliminates risk or which substitutes certainty for uncertainty." (1) It is unquestionably true that "the occurrence of events insured against cannot wholly be prevented" (1), but experience has demonstrated "that the uncertainty of financial loss through such occurrences can be eliminated by distributing the loss over a group" (1). Therefore, "when a large number of people contribute to a common fund from which any individual contributor will receive a certain financial return at the expiration of a given time" (1), or his estate or beneficiary be recompensed financially in case of his premature decease, "the only certain loss sustained will be his personal contribution or the premium charged, and the sum paid to his estate or to his beneficiary is apportioned from the contributions of each member in the group" (1). Hence, it has been well said, "Insurance is the elimination of uncertainty or the replacement of uncertainty by certainty." With morbidity to a great or less degree always near, prudence demands protection to dependents, and affection for those we love insists that such protection be commensurate with present income, in case of accidental or premature death. A protecting power or return of such a nature should not partake of a gamble. When honestly and conservatively conducted modern assurance protection is the safest institution in existence.

Any estimate as to how long a given individual will live is the most uncertain problem known, but a general mortality rate based upon the lives of a great number of individuals can by competent actuarial means be quite accurately determined and a safe, workable forecast of future terminations be as closely ascertained. Babbage states, "Few things are less subject to fluctuation than the duration of life in a multitude of individuals." (2)

The laws of probability indicate that like the law of chance, there must be a law governing mortality. What cause or causes operate in determining that from the dates of birth of a large number of people, a definite number will die each year until all have died, no one knows. Hence, our inability to gauge the actual force of mortality. Notwithstanding this lack of knowledge, however, human ingenuity has, "by studying the records and death rates or rate of death in many groups of individuals and carefully investigating all collateral circumstances" (3) which in the minds of numerous investigators "have probably affected that rate, found it feasible to surround any future group of individuals with what would be approximately the same condition and problems and so anticipate closely the same rate of mortality." (3) To come thus closely to a sound, workable system of estimating the future rate of death of a large group, shows

* Read before the Philadelphia Medical Examiners' Association, February 11, 1920.

the value of accurate mortality statistics, and how, without such excellent tables at hand, certainty would again give way to uncertainty, and a practical accuracy degenerate into primitive chaos.

Accurate and original data in all mortality statistics are of the greatest importance. "The two sources from which the best known mortality tables in existence today have been obtained are, first: Population statistics from census enumerations with mortality records from registration centres and, second, the mortality statistics of insured lives." (4) It is thought to be questionable whether the statistics of a general population can be used in determining the accurate mortality of insured lives. They represent the average death rate of a population group and so approximate the "true law of general mortality," but an insurance company wants to know more particularly as to the mortality occurring among selected lives, for such lives are subject to factors that may influence the death rate considerably, and of necessity have to be carefully considered.

It is true "the mortality tables based on population statistics formed the first scientific basis for insurance rates, but as their approximation to true insurance mortality was not close, they were supplanted by tables based on insured or selected lives as soon as a sufficiently large experience on selected lives was attained. The present tables used by American life insurance companies and required by most state insurance departments as a basis for the valuation of policy liabilities have been built from data of insured lives. Such a mortality table has been described as 'the picture of a generation of individuals passing through time.' (5) Taking a group of persons entering at a certain age, it traces and notes the history of the entire group, year by year, until all have died. The essential features of such a table are the two columns of the number living and the number dying at designated ages. Such is the American experience table which is widely used by the old line companies in the United States, particularly for the computation of premium rates. It is assumed that a group of one hundred thousand persons come under observation at exactly the same moment as they enter the tenth year of life. Of this group 749 die during the year, leaving 99,251 to begin the eleventh year. The table proceeds in this manner to record the number of the original one hundred thousand dying during each year of life and the number living at the beginning of each succeeding year until but three persons of the original group are found to enter upon the ninety-fifth year of life, these three dying during that year. This table represents the mortality data in their final form for use in expressing the probabilities of death and of survival. It is manifestly impossible for any insurance company to insure a group of one hundred thousand persons at exactly the same age and at exactly the same time, and it is equally impossible to keep any such group under observation until all have died. Insurance policies are written at all times of the year and on lives at various ages. It is entirely practicable that a record be kept of all insured lives, showing at each age the number of

persons under observation, and of those observed for one year at least, the number who have died. If data are collected, therefore, showing, first, the ages at which persons come under observation; second, the duration of the period of observation; and third, the number dying during one year for each age, the material will be furnished out of which a mortality table may be constructed. In the United States there is an important classification of tables of three kinds dependent on the data used in their calculation. They are known as select, ultimate and aggregate tables. These terms have reference to the question whether the data used have been affected by medical selection. The tables most used in the United States today by insurance companies are three, i. e., 1, the Actuaries' or Seventeen Offices table was calculated from the experience of seventeen British life insurance companies and was introduced into the United States by Elizar Wright as the standard for the valuation of policies in Massachusetts. This table has at the present time been largely supplemented by, 2, the American Experience table, which was published in 1868 by Sheppard Homans, and was calculated from the mortality experience of the Mutual Life Insurance Company of New York. 3, The National Fraternal Congress table was derived from the experience of two American fraternal orders, and was first published in 1898." (6) Once a satisfactory mortality table has been built, it is but logical sequence to adopt such a table, until a better one has been constructed; and "by applying the laws of probability to it the risk in life insurance is measured and closely approximated." With this rather lengthy résumé as to the foundation upon which all successful life assurance institutions must be built, let us now consider an important part of both the ground and superstructure, medical selection.

The first question presenting itself to the medical director as he scans the pen picture of an applicant seeking insurance protection, is, "Has this man or woman, an average chance of attaining his or her expectancy?" We have seen that the "mean duration of life," or as it is better known in the insurance world, "the expectancy of life," is formulated by the use of an approved mortality table to which is applied the law of average or better, of probability. The expectancy of life, therefore, is not how long an individual may live, but it is or means the average number of years, members of a large group of individuals of the same age will survive.

Medical decision as to the desirability of a risk, must also be influenced by a number of other important factors, the probable working of which on each individual applicant must be quickly and safely determined. Family history, personal history, weight and measurements, occupation, environment, and last, but not least, the habits and character of the person, and the reputation and ability of the medical examiner who has penned the sketch, and the care he has exercised in making the report. These would cover the medical aspects of the case. The issuing of a policy, however, is further dependent upon satisfactory inspection and the favorable scrutinizing views of the authorities who

pass upon financial, business and agency questions.

Let us now see how the family history of an applicant influences medical selection:—An expressed marked longevity in the family history of an applicant, particularly in the parents and grandparents, I believe to be the strongest single factor in estimating the desirability of any risk. The offspring from such a stock, have usually great resisting power. They do not contract infections readily, and if disease is contracted, they resist its ravages longer, respond more readily to treatment, and unless some idiosyncrasy is present, often escape conditions that would be fatal to those not so blessed.

Similarity in build to one's ancestors is also a notably favorable factor, particularly in plus weights. Where an applicant's parents live to the age of seventy, or over, or where their earlier decease resulted from accidental cause or acute disease, especially if advanced age is noted in the grandparents, and the applicant's brothers and sisters appear to be healthy, the family history is assumed to be first class.

The Caucasian race shows the greatest resisting powers as a rule. They certainly show the lowest mortality. The following remarks apply to the white race alone:

Apoplexy in the family history, even two or more cases, if not associated with other impairments, or trivial ones in the applicant, is ordinarily not of serious import. However, with this history a more scrutinizing selection would be made. These applicants show a mortality rate actual to expected of 108 per cent.

Cancer in the family history, two or more cases, is not considered serious. A recent study of a great number of cases has shown that the disease is probably neither hereditary, infectious nor contagious. This class shows a mortality rate actual to expected of 79 per cent.

Epilepsy in the family history is of no moment. Too few could be found. There were 121 instances and two deaths.

Heart disease in the family history, two or more cases, shows a somewhat higher mortality in this class of applicants and would cause a more careful selection to be made. The mortality rate actual to expected is 113 per cent.

Insanity in the family history, two or more cases, is usually of little moment, as affecting the applicant. Mortality of this class is only seventy-four per cent. of the expected.

Pneumonia in the family history, two or more cases, would cause a tighter selection. This is usually not considered an important impairment.

Tuberculosis in the family history profoundly and unfavorably influences the mortality rate of an applicant, particularly if he is a light weight and under thirty five years of age.

An applicant under thirty should be of average weight and even then a history of association with a tuberculous brother or sister or parent, or the fact that a parent died of or has the disease, would occasion a most rigid medical selection. Changing from lower to higher cost plans, as endowments, will not meet the extra mortality

in these cases. Only a lien or rating, imposed on selected cases, will enable the successful handling of this class. Let me state how tuberculosis in an applicant's family history affects the risk. The medico-actuarial mortality investigation developed that the normal death rate from tuberculosis of the lungs for all heights and weights combined is twenty-two and one-half per cent. of the deaths from all causes, at ages of entry under twenty-nine years, and at ages of entry thirty to forty-four years, twelve per cent. With this in mind the following table shows how heavily this disease falls on light weights with a family history of tuberculosis: (7)

VARIATION FROM AVERAGE WEIGHT.

	Entry Age 15-29	Entry Age 30-34
Minus 25 lbs. to minus 45 lbs..	51 per cent.	27 per cent.
Minus 5 lbs. to minus 20 lbs..	48 per cent.	26 per cent.
Average weight to plus 20 lbs..	34 per cent.	12 per cent.
Plus 25 lbs. to plus 45 lbs.....	9 per cent.	3 per cent.

In judging the insurability of risks of this character, we would find a fair average mortality is obtained in subjects having a family history of tuberculosis if we eliminate light weights under thirty years of age. I believe infancy and childhood are preeminently periods when tuberculosis infection is likely to occur, and that danger of infection through the digestive tract is nearly as great as by the respiratory passages.

Clinically, the ages from fourteen to forty-five may be looked upon as a danger zone. At the younger ages at entry with an associated tuberculous family history, selection more particularly rests upon facts as to past and present development, home and occupational environment and habits.

PERSONAL HISTORY

Mortality figures mentioned in any of these impairment classes have been obtained by actual experience of a large number of the old line companies who contributed their individual experiences over a period of twenty-four years and members of the committee in charge thereof were among the most prominent medical directors and actuaries in this country. The material embraced many hundreds of thousands of cases and was furnished for their study by institutions that controlled ninety per cent. of the insurance in force in the United States.

The presence of more than one personal impairment markedly influences any action taken by the medical director, and is frequently the cause of adverse action in many instances. In some prospects, what would appear as an apparently slight impairment would be of marked suggestive import when linked with a defect of presumably little moment. This should always be borne in mind.

Appendicitis—no operation.—One attack within less than two years of date of application shows a mortality of ninety per cent. of the expected. One attack within two to five years from date of application shows a mortality of 103 per cent. of the expected. One attack within five to ten years of date of application shows a mortality of sixty-eight per cent. of the expected. One attack without operation would postpone the case for a full year. Two or more attacks without operation would postpone the case at least three years, but each case

would be judged on its individual merits before final action.

Appendicitis with operation.—If wound is closed at operation—no drainage—we would consider such a case three months after recovery, but would be careful to eliminate any subsequent history of digestive disturbances and obtain full data from the operating surgeon. In a pus case, wound not closed, and drainage used, we would not consider the risk for a year after recovery. Here trouble from adhesions, etc., is feared as it is vastly more likely to occur than in a clean case. In eighty per cent. of drainage cases, however, I think it is safe to assume that if any trouble from adhesions, etc., is to occur, it will occur within one year of operation or not at all.

Asthma.—Great care is used in clearing up such histories and eliminating emphysematous conditions and other causes or effects of an organic nature. Mortality in these cases where one attack has occurred within two years of date of examination is 120 per cent. of the expected. Between two and five years the expected mortality is less. Only the most favorable cases would be accepted and these limited to small amounts and plans going off the books at age of fifty-five or sixty years at the latest. Exceptional cases might be accepted for longer plans if under age of forty provided a lien or rating were imposed. Statistics show that more than one attack within two years of date of application gives a mortality experience of 124 per cent. of the expected, and after two years mortality increases to 129 per cent. of the expected.

Blindness.—Total blindness or eyesight which is poor and progressively growing worse makes a case uninsurable on any plan. Only in exceptional cases of long standing where a constant care taker is employed and unusually favorable environmental conditions present would we insure, and even then only a small amount on a heavy rated endowment plan would be rarely considered. Blindness in one eye, from traumatism where light perception exists and is not growing less, the other eye being sound, would not be a bar to insurance if disability benefits were excluded.

Bladder.—Cystitis of short duration—in young persons is usually of little moment. After forty, however, it may be a manifestation of organic disease. All cases of prostatitis, stone, papilloma, etc., are carefully inquired into, family physician's blank obtained and careful chemical and microscopical examination of one or more specimens made at home office before deciding as to insurability.

Blood spitting.—Is always an impairment of the greatest importance, and may be a symptom of tuberculosis, ulcer of the stomach, or cirrhosis of the liver. Such a history usually postpones for ten years or declines a risk. History of one attack without distinct symptoms of tuberculosis of the lungs occurring less than five years prior to date of application gives a mortality actual to expected of 151 per cent. One attack, five to ten years prior to date of application 131 per cent. and one or more attacks, more than ten years prior to date of application 102 per cent. of the expected. Other factors being favorable such cases may be con-

sidered on selected plans only after that period of time has elapsed.

Change of life.—Unless first class in all other particulars, women at the climacteric should be postponed until the change has been successfully accomplished, particularly if a family or personal neurotic history exists.

Deafness.—If total or marked and increasing the applicant is a poor risk on account of the extra hazard from accident. Deaf mutes if of matured age, however, might be considered, all else being equal, on rated endowment without disability. Partial deafness in one or both ears, if ordinary conversation can be easily heard and a watch's tick recognized when not in contact with the skull, would not ordinarily prevent insurance with disability benefits.

Ear disease.—A history of otitis media or discharge, if recovered from, does not render a case uninsurable. Recurrence or continuation of discharge, if not purulent, offensive and gritty with the absence of evidence of mastoid disease or bony involvement and a sufficiently large perforation in drum, so situated that drainage could take place readily if discharge recurred, would permit of insurance, perhaps with a lien or rating, rarely without. If repeated attacks occur we would obtain an aurist's opinion. Any present ear trouble with persisting discharge would postpone or decline such a case. After a mastoiditis we would insure upon full recovery.

Epilepsy.—Such cases cannot be safely insured on any plan. A history of one or two convulsions in early childhood with no after occurrence is usually of no moment.

Diabetes.—True cases of diabetes mellitus are not insurable on any plan.

Duodenal ulcer.—If diagnosis is unquestionably correct, particularly if confirmed by operative procedure, these cases are insurable two years after full recovery, for moderate amounts on endowment plans, providing no digestive disturbances have occurred since recovery.

Fever.—Typhoid fever cases are taken six months after full recovery. Complete restoration of health and regaining of weight might enable favorable consideration two or three months earlier in rare instances. Cases with history of malaria are postponed until three months after full recovery. An applicant who has had malarial hematuria or lives in a locality where pernicious malarial types abound is ordinarily uninsurable.

Anal fistula.—With or without operation, one attack, less than two years of date of application shows a mortality of 120 per cent. of the expected. One attack within two to five years of application 136 per cent. of the expected and one attack after five years of the date of application 100 per cent. of the expected. If tuberculous cause can be eliminated and successful operation has been done we would insure, unless applicant was a light weight with doubtful family or personal history. In plus weights the history of anal fistula is of comparatively little moment.

Gout.—Under forty it is an exception to receive cases where such a history is confirmed. We would

always investigate carefully and call for all available data. After forty or in any case if we believe true gout to have been present, we would decline to consider. One attack of true gout within five years or less, of date of examination, shows a mortality of 190 per cent. of the expected. One attack of true gout within from five to ten years of date of examination shows a mortality of 172 per cent. of the expected.

Gravel, renal colic, stone in kidney, renal calculus.—One attack with stone passed, negative chemical and microscopical home office specimen and the x ray negative would make such a case insurable after two full years have elapsed. Repeated attacks would decline.

Gonorrhœa.—Postpones a case until full recovery, then we would consider on satisfactory home office specimen and no evidence of sequelæ.

Goitre.—Simple cystic goitre without evidence of pressure and nervous symptoms can be taken on endowment plans for limited amounts. Cases are always carefully selected and full history developed. Any suspicion of an exophthalmic nature or operation for suspected Graves's disease, would render the case uninsurable.

Enlargement of glands.—If not due to tuberculosis, syphilis or other serious disease, glandular enlargements are of little moment. Obtain family physician's blank and eliminate all tuberculosis suspicions before considering. Glandular enlargements of the neck are always looked upon doubtfully and these cases rarely taken.

Disease of gallbladder.—One attack of catarrhal jaundice with family physician's blank showing same to have been unaccompanied with colic or other evidence of cholecystitis and with no subsequent history of digestive disturbances would not prevent insurance. Cases of cholelithiasis (gallstones), however, are not insurable until five years have elapsed since recovery from attack with no digestive disturbances in the interim. Two or more attacks would decline.

Gallstone with operation.—Gallbladder removed or not: Selected cases are insurable for small amounts on endowment plans after two or three years, if no digestive disturbances have been in evidence and other factors are first class.

Gastric ulcer.—Cases with history of true gastric ulcer, whether a gastroenterostomy has been performed or not, are not insurable upon any plan.

Hip disease.—Renders a case uninsurable.

Heart disease.—Valvular disease, myocarditis, cardiac dilatation or hypertrophy render a case uninsurable. A history of valvular disease due to inflammatory rheumatism is particularly of serious import. An irregular or intermittent heart usually postpones or rejects. If cause can be determined—i. e., coffee, tea or tobacco, and is distinctly not of organic nature, we might in a young prospect issue a rated or liened policy. A pulse under fifty-five is frequently of serious import, and a pulse persistently over ninety would be postponed or declined. Only where of long standing in one under forty and where an idiosyncrasy can be satisfactorily established, would the issuing of a modified policy be favorably considered.

Insanity.—In an applicant's history renders a case uninsurable.

Laryngitis.—Cases running an acute course and not of long duration are not of much moment. Long continued cases, chronic forms, however, are frequently due to growths, tuberculosis of chronic thickening of the vocal cords of uncertain cause and are not desirable risks.

Neurasthenia.—The types assumed are legion. Such histories are always carefully investigated and family physician's blanks with full data as to date, symptoms present, duration and treatment obtained. Each case is judged individually and most careful selection made in every instance.

Ovarian disease.—If of functional nature only at menstrual periods, all else being equal, each case is carefully considered individually after obtaining complete data and family physician's blank. Operative procedure in such cases necessitates careful study, attending physician's and surgeon's opinions. Satisfactory findings do not prevent the issuance of endowment policy for small amount with or without a lien or rating.

Paralysis.—If due to central cerebral lesions declines a case. Peripheral forms such as Bell's palsy, wrist drop, scrivener's palsy or the sequelæ of anterior poliomyelitis, if not extreme, render a case insurable on selected plans. Mortality rate in these latter cases is 105 per cent. of the expected.

Pleurisy.—One attack of dry pleurisy of less than ten days' duration we do not hesitate to accept. Cases with effusion are studied carefully and full details with physician's blank obtained. We would hesitate to take a case of serious effusion at any time, particularly in a lightweight or where it is thought a family or probably personal tuberculous factor is present. Cases accompanying pneumonia where good laudable pus has been found and evacuated and recovery has been prompt, would be considered favorably after six months from date of recovery, all else being equal.

Pneumonia.—If fully recovered from, weight regained and no sequelæ present, are insurable after six months.

Prostate gland.—With such a history the risk is declined after forty-five. In young subjects, a physician's statement is secured with complete details and one or more specimens sent to the home office, before decision is given.

Articular rheumatism.—One attack less than two years of date of examination shows a mortality of 120 per cent. of the expected. One attack more than five years since date of examination shows mortality ratio of 109 per cent. of the expected. More than one attack less than two years of date of application, 123 per cent. of the expected. One attack two to five years from date of application 109 per cent. of the expected. Careful selection is always made in these cases and heart critically examined before decision. The muscular forms of rheumatism are usually of no great moment. True rheumatoid arthritis declines such an applicant.

Rupture.—A complete or incomplete hernia, if easily reduced and a properly fitting truss worn would render a case insurable. If no truss is worn a lien or rating would be imposed.

Urethral stricture.—Each case is individually considered as to calibre of the urethra, complications, whether full stream can be easily passed, duration, etc., with chemical and microscopical examination of specimen at head office. Doubtful cases are usually declined. History of esophageal stricture declines.

Syphilis.—Syphilis has the distinction of being an impairment where the remoteness of the original infection adds increasing hazard to the undesirability of the prospect. Under the most favorable conditions the mortality ratio in these cases, whether treated or untreated, remote or recent, is 138 per cent. of the expected. I do not believe any company can afford to absorb even a preferred case of syphilis, even where medical procedure has been followed, no matter how thoroughly, on any life plan at ordinary rates. This particularly applies to the ages of thirty-five and over. At younger ages, other factors being desirable, and if no history of secondary or tertiary symptoms has been discovered, we might, upon satisfactory negative Wassermann blood tests, issue a short rated endowment. These plans must mature not later than fifty or fifty-five years of age, and no disability would be granted.

Tumors.—Such histories are always questionable. Simple cyst or fatty tumors if favorably situated and not extensive do not affect insurability. Epithelioma (notwithstanding its benign nature in many instances), cancer, sarcomata and syphilitic gummata, etc., always decline an applicant.

Vertigo.—Such history unless unquestionably due to digestive indiscretions, refractive troubles of the eye, or idiosyncrasy such as sight of blood, etc., and of immaterial nature, we would not consider insurable. Vertigo is frequently due to organic disease of the brain, serious ear trouble and epilepsy.

Tuberculosis of the lungs.—If tubercle bacilli have ever been demonstrated we would decline no matter how remote the seizure or apparently perfect the cure. Tuberculosis of the glands including scrofulous glands of the neck, one attack less than ten years of date of application gives a mortality actual to expected of 178 per cent. One attack more than ten years of date of application 113 per cent. Tuberculosis of bones, hip, spine and joints, one attack less than ten years of date of application gives a mortality of 190 per cent. of the expected. One attack more than ten years of date of application gives a mortality of 120 per cent. of the expected. Only exceptional cases with such histories might be considered after ten years had elapsed on rated endowment plans.

At the present time I purposely have not referred to a series of important impairments which daily cause anxiety and worry to the medical departments of all insuring companies. I refer to the chemical and microscopical findings of urine, to blood pressure readings and to specific data as to the build of an applicant, i. e., a decided departure from average weight. These impairments would necessitate time and space not contemplated in the scope of this paper and have been reserved for a more op-

portune time. Suffice it to say, each of these factors has a most decided bearing on conservative selection: each must be considered specifically and at the same time weighed as a part of the whole; each must be studied individually and all favorable offsets considered; each must be measured by the medical director's experience tempered by the known actuarial and statistical findings of its class.

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329 WISTER STREET.

THE THERAPEUTIC VALUE OF CUPPING.

Its Use and Abuse.

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In the healing art advantage is taken of every therapeutic means. To cure or alleviate the ills of mankind pharmacotherapy is most frequently used, and when prescribed in the right case and in the right way will always do much good. A lack of knowledge of the science of pharmacology and the art of therapy has created therapeutic pessimists, who timidly use one or two drugs in the treatment of disease, and therapeutic polypharmacists, whose prescriptions are a conglomeration of too many drugs.

In addition to drug therapy, mechanical, thermal, chemical, electrical, psychic and hydrotherapy are occasionally used with good results. The improper or indiscriminate use of any of them does harm to the patient, to the value of the remedy itself and to the physician. One of the most popular mechanical therapeutic agents is dry cupping. This is a remedy of great antiquity and it is used by many people in many lands. It belongs to that group of therapeutic substances known as counterirritants, which, when applied to the surface of the body, will, by their own irritating action, relieve irritation of the underlying deeper structures or organs.

The entire theory on which the physiological action of counterirritation is based is indefinite and uncertain. In the earlier days of medicine, when humoral pathology dominated medical thought, counterirritants were supposed to draw the diseased humors from the deeper organs to the surface of the body. With the advance of medical knowledge the therapeutics of counterirritation and cupping were based on the theory that irritation or suction of the skin produced a local hyperemia, bringing more blood to the surface and thereby relieving congestion of diseased internal organs. It was also thought that surface irritation caused reflex action resulting in favorable circulatory or trophic changes in the underlying organs. The work of Head and

Mackenzie on surface localization in visceral diseases has thrown much light on the subject of counterirritation. According to these observers, every diseased internal organ, through its nerve supply causes an area of hypersensitiveness in a certain segment of the spinal cord. Within this hypersensitive spinal area there are nerves which project to the periphery to supply definite areas or zones of muscle and skin. Through the proximity of certain sensory, visceral and skeletal nerves in the spinal cord, disease or irritation of an internal organ causes an area of pain, tenderness or hypersensitiveness in a corresponding definite area or zone on the surface of the body. It is therefore evident that since visceral irritation affects a definite area on the skin, a counterirritant applied to that surface area will affect the corresponding internal organ.

The humoral theory is mentioned here for historical reasons only. To assume that the therapeutic value of cupping is due to the removal of blood from the internal organs to the surface of the body is erroneous. The entire quantity of blood held in the hyperemic circular spots produced by the cups on any area of the body is insignificant when compared with the quantity of blood which is circulating within the body. To produce sufficient peripheral vasodilatation as to bring more blood to the surface and less to the internal organs quite other therapeutic means are necessary. A warm bath or a mustard bath will cause dilatation of the surface blood vessels and will do more good than any amount of cupping. It is doubtful whether the application of cups, like so many dots, all over the chest will produce reflexly changes in the lungs. To cause reflex action in the lungs nothing will serve the purpose better than the proper application of cold water. A mustard paste, applied all over the chest, especially when the mustard is mixed with warm ground flaxseed, will produce peripheral vasodilatation, and reflexly affect the internal organs.

Whatever the theory on which this popular remedy of cupping is based, its true value as a therapeutic agent can only be determined by practical clinical investigation. During the last two influenza epidemics, when it was hard to find a living human being whose chest had not been cupped either as a prevention or as a cure for influenza or pneumonia, I carefully investigated the therapeutic worth of this old traditional remedy. I have asked quite a number of patients how they felt after being cupped, the cupping usually having been done either on the advice of the family physician or because of their own faith in this inherited household remedy. The majority of patients thought that they were not at all benefited by the cupping. Some said that they felt somewhat better for a while after being cupped but soon felt no change for the better. A few stated that they felt much better after the cupping process and were sure it had saved them from a serious illness. In the cases where the cupping was said to have done much good, it was difficult to tell how much of the benefit was due to the actual cupping and how much to the hypnotic suggestion produced by so old and respected a household remedy. The patients, how-

ever, all complained that the cupping had made them weak and that the skin felt sore and painful.

In addition to their own statements as to their subjective feelings after being cupped, the effect of cupping on the physical signs, the pathological symptoms, and the temperature curve were studied in a number of cases. Observations were made on the possible influence of cupping on the onset, course, and termination of various respiratory diseases.

From this clinical investigation on the subjective and objective effects of cupping it may be definitely stated that it does not prevent or cure influenza or pneumonia or any other disease of the lungs for which it is most commonly used. Cupping may do some good in edema or congestion of the bases of the lungs, in renal congestion, in subacute pleuritis, in lumbago or other muscle aches, in neuritis and neuralgia. Cupping does actual harm to infants, young children, asthenic adults, and the aged. It makes them weak, and their skin sore, painful, and black and blue. The entire process of cupping, with its imposing paraphernalia, is so terrifying to young children that it should never be used in any disease of childhood.

Whatever good there may be in the counterirritation of cupping has been grossly abused. It is being advised in almost any real or imaginary disease of the chest without any diagnostic thought or therapeutic reason. It has become almost the exclusive trade of barbers, discarded nurses, and crafty old women. When cupping is used in the right case with proper care and discretion it may be of some assistance in the care of the sick. That it renders some useful service in the ills of mankind has been attested to by its extensive use as a household remedy for many generations. But its careless, thoughtless, and offhand use for any disease or no disease has done much harm to many patients and brought down this popular remedy to the ranks of a quack medicine and a therapeutic humbug.

222 EAST BROADWAY.

THE BIOCHEMISTRY OF DRUG ADDICTION.

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The medical profession has always regarded drug addiction as something unethical, to be treated with contempt, probably because it was looked upon as a vice, which they were unable to combat. The contempt for the drug addict became so general that almost every ethical practitioner refused to treat these unfortunate sufferers. National prohibition brought the subject to the foreground and made it a widely discussed topic. Now the public justly looks to the profession for relief and cure.

The helplessness of the profession was not due to the incurability of the drug habit, but rather to a lack of knowledge of the subject. Physiological chemistry and biochemistry had not developed sufficiently to accord investigators a clear picture of the biochemical composition of the protoplasmic struc-

ture of various tissue building cells, either in the normal or in the pathological state.

The wonderful progress made in biochemistry during the last decade has made possible accurate investigations and determination of the qualitative and quantitative makeup of certain chemical complexes, hitherto unknown to science. One type of these chemical complexes is the lipoids. Careful parallel investigations of normal and pathological tissues led to discoveries and conclusions of great value in almost all diseases, including the ailment wrongly designated as drug habit. The name drug habit covers only the inordinate desire for opiates, but does not include the pathological changes which take place in various tissues of the body, especially in the protoplasmic structure of the nervous system. Biochemical investigations prove that the tissues of drug addicts are decidedly poorer in lipoids than those of normal individuals and that the difference in lipoidal content is especially marked in the tissues of the nervous system. The lack of sufficient lipoids in the nervous system is responsible for the longing for drugs, as will be explained later.

Overton and Meyer were among the first to report on the influence of certain lipoids upon poisons and toxins. Their early investigations show that lipoids have a solvent action upon narcotics. Nerking and Reichert state that the introduction of certain lipoids into the blood stream diminishes, or entirely eliminates, the effect of narcotics. Furthermore, it is a well established fact that the lipoids of various organs, as well as of the nervous system, may be extracted and consumed by the administration of narcotic alkaloids. An excess of toxins has a similar effect. The detoxicating action of the lipoids is of considerable significance in cellular physiology. The fact that the detoxicating capacity of lipoids remains after extraction from the mother cell aggregate, gives us another means of controlling certain conditions which previously resisted every effort of the medical profession. One of these is drug addiction.

All narcotic alkaloids have either a stimulating or a paralyzing power, and all have the common characteristic of a solvent action upon the lipoids of the tissues. Through this biochemical activity of the narcotic alkaloids the detoxicating influence is diminished. An abundant quantity of toxins of low nitrogen content in the tissues exert their irritating influence, which requires a certain amount of neutralizing chemicals, in this instance narcotics, usually alkaloids, to overcome the craving produced by the toxins. In this way a gradual progressive destruction takes place in the nerve tissues, requiring more and more opiates for stabilization.

The belief that certain addicts through experience and self-analysis can properly regulate the amount of opiates required daily to keep them balanced, is erroneous and contrary to the pathological findings. It is probable that addicts will regulate the amount of one kind of opiate, but use another. Generally addicts are multinarcotics, using all available drugs.

The rational treatment for restoring the lipoidal equilibrium of the tissues of addicts would be to replace the amount of lipoids lost. The very important fact that the detoxicating power is retained

in their chemical complex when this has been extracted to the same degree as in the mother cell aggregate, supplies us with a reliable foundation on which to base proper therapeutic treatment to overcome the pathological changes caused by narcotics in the tissues, and the craving which is the result of these changes.

Lipoids are found in practically all the various cells of the body of both animals and plants. Their peculiar chemical character makes their use possible. We are in position to determine the synergy of various lipoids, which fact enables us to replace the lost lipoids of the body up to a normal point, bringing the patient into normal condition, both physically and mentally. The clinical and experimental data at hand indicate that the introduction of lipoids into therapeutics will prove a means of enlightening us regarding various aspects of metabolism.

ANALYSIS OF OUTPATIENT MEDICAL WORK.*

A Study of 8,863 Dispensary Records by the Public Health Committee of the New York Academy of Medicine

INTRODUCTION.

In an analysis of the medical work of dispensaries an objective gauge had to be taken as a measure of the efficiency of the different institutions. The only extant and easily analyzable measuring standard is the medical history. Under the prevailing conditions it is admittedly an imperfect standard, but the only one available. This method of study is predicated on the fact that certain basic information concerning the patient's physical condition, past history and environment, as well as results of laboratory and other procedures, must be recorded as an intelligent guide in diagnosis and treatment. It is obviously impossible for anyone to hold in mind the necessary details for a group of persons, particularly in dispensaries where large numbers come to each physician's attention daily and where the medical service is frequently changing and several different physicians may handle the same case. If the records do not contain a minimum of information that is generally recognized as indispensable, it is justifiable to assume that the medical service is of an inadequate character.

The study presented herewith is based on this premise, and is open to the objection that the hurriedly made out records in the dispensaries do not properly represent the work done, and that it is frequently superior to what the records would indicate. Yet, the records constitute the only means by which an objective presentation of medical work can be accomplished, and when a considerable num-

*This constitutes a part of the report on the Dispensary Situation in New York City by the Public Health Committee of the New York Academy of Medicine, of which Dr. Charles L. Dana is chairman, Dr. James Alexander Miller is secretary, and E. H. Lewinski-Corwin, Ph. D., is executive secretary. The membership of the committee is as follows: Dr. John S. Billings, Dr. Nathan E. Brill, Dr. Robert J. Carlisle, Dr. James B. Clemons, Dr. Haven Emerson, Dr. Lewis F. Frissell, Dr. Arpad G. Gerster, Dr. S. S. Goldwater, Dr. John A. Hartwell, Dr. Ward A. Holden, Dr. L. Emmett Holt, Dr. Otto V. Huffman, Dr. Walter B. James, Dr. Walter L. Niles, Dr. Bernard Sachs, Dr. Thomas W. Salmon, Dr. Frederic E. Sondern, Dr. M. Allen Starr, Dr. Howard C. Taylor, Dr. W. Gilman Thompson, Dr. Philip Van Ingen, Dr. Karl M. Vogel, Dr. George B. Wallace, Dr. Cassius H. Watson, Dr. Herbert B. Wilcox.

ber of records is used a fairly accurate picture of the clinical procedures can be obtained. It is to be hoped that this study will stimulate the institutions toward making better provision for the satisfactory recording of medical work in dispensaries.

Three different sets of records have been used in the preparation of this study: First, a large number of sequence cases, or cases filed in the order in which the patients applied to the dispensary, were taken; secondly, an analysis was made of selected diagnosed conditions from the different departments, and thirdly, an analysis was made of records from special institutions. The sequence records were taken from the various departments of the following dispensaries: Bellevue, Beth Israel, Cornell Medical College, Fordham, Gouverneur, Harlem, Lebanon, Lenox Hill, Lincoln, Long Island College, Mount Sinai, New York Hospital, Northeastern, Post-Graduate, Roosevelt, Staten Island, St. Bartholomew's, St. Luke's, St. Mark's, St. Vincent's, Bellevue Medical College, Vanderbilt, West Side.

The reason that selected diagnoses were taken in addition to "sequence" cases, was that cases taken in order of sequence from the general files of the dispensaries and relating to a wide variety of pathological conditions, many of trifling significance, might not adequately reflect the kind and quality of medical service in outpatient departments, and an additional study of selected diagnosed conditions treated for a considerable length of time might in fairness to the institutions well supplement the other study. The conditions chosen were those which readily lend themselves to ambulatory treatment, which run a more or less protracted course, present some medical interest to the physician and which in many instances are the cause of economic and social difficulties to the patients. Accordingly 2,718 such diagnosed records from the several departments were collected and tabulated.

They were taken from twenty-one of the twenty-four dispensaries from which the sequence cases were selected, and from the Presbyterian Hospital, where a filing system arranged by diagnosis had made the collecting of sequence records impossible. At the Staten Island Hospital, the Northeastern Dispensary and St. Bartholomew's Clinic it was not possible to find a sufficient number of diagnosed cases in any of the departments of the institution to make such a study of value for these institutions. At five other institutions—Fordham, Long Island College, Roosevelt, Vanderbilt and Gouverneur—no diagnosed records could be found for the general medical clinic, although they were available in other departments. At Cornell Medical College in the general medical clinic only a few records could be found diagnosed for the selected chronic diseases. At Bellevue and at the Post-Graduate it was necessary to go through the records for eight months to find a sufficient number of cases for purposes of comparison. In departments other than general medical it was not always possible to obtain a sufficient number of records for each group, which accounts for the variety in the numbers taken from different institutions.

A third series of records was taken from the following institutions treating special conditions:

Eye, ear, nose and throat.—Manhattan Eye, Ear, Nose and Throat Hospital; New York Eye and Ear Infirmary; Herman Knapp Memorial Hospital.

Orthopedic.—Hospital for Ruptured and Crippled; Hospital for Deformities and Joint Diseases; New York Orthopedic Hospital.

Neurological.—Neurological Institute.

Dermatological.—New York Skin and Cancer Hospital.

Gynecological.—Woman's Hospital; New York Nursery and Child's Hospital; Lying-In Hospital.

Pediatric.—Babies' Hospital; New York Nursery and Child's Hospital.

In these institutions both sequence and diagnosed records were studied; first, a group of sequence cases was taken, and if this group did not contain a sufficient number of cases of a selected disease to make possible a comparison with the corresponding departments of the general dispensaries, another group was added, but the selection was then limited to diagnosed records of the selected condition. With minor exceptions, all the records were for patients treated from January to April, 1917, and from January to April, 1918, thus providing a basis upon which to judge the effect of the war upon dispensary service and to make the survey represent the average work in two different years.

The number of records of each group of records, sequence, diagnosed, and special institution, is appended herewith.

SEQUENCE RECORDS.

General medical departments.....	1,774
Pediatric departments	398
Neurological departments	247
Surgical departments	946
Dermatological departments	333
Orthopedic departments	140
Gynecological departments	437
Eye, ear, nose, and throat departments.....	695
Total	4,970

RECORDS OF SELECTED DIAGNOSED CASES.

Bronchitis	283
Chronic nephritis	102
Chronic rheumatism	150
Chronic valvular heart lesion.....	219
Rachitis	57
Malnutrition	105
Fracture	268
Cellulitis	223
Lacerated pelvic floor and cervix.....	211
Epilepsy	41
Gastric ulcer	117
Eczema	241
Syphilis	192
Cerebrospinal syphilis	69
Gonorrhoea	156
Conjunctivitis	87
Trachoma	25
Otitis media	170
Total	2,716

RECORDS FROM SPECIAL INSTITUTIONS.

Pediatric dispensaries	100
Neurological institute dispensary	140
Skin and cancer hospital dispensary.....	67
Orthopedic dispensaries	322
Gynecological dispensaries	154
Eye, ear, nose, and throat dispensaries.....	394
Total	1,177
Total number of records.....	8,863

The following is a general summary of the findings upon the examinations of the records subdivided under four heads: a, the effect of the war on the quality of dispensary work; b, comparison of special institutions with the corresponding departments of general dispensaries; c, comparison of diagnostic, therapeutic and supervisory procedures for sequence cases by departments and d, comparison of diagnostic procedures for selected diagnosed conditions.

THE EFFECT OF THE WAR ON THE QUALITY OF DISPENSARY WORK.

As noted in the introductory statement, the records studied were taken partly from the files of the first three months of the year 1917 and partly for the same period of the year 1918, in order to make possible a comparison of the dispensary service between these years and to judge to what extent the war had affected ordinary dispensary procedure. The analysis of the records in the general medical, pediatric and neurological departments did not show any definite tendency towards either improvement or deterioration in 1918, compared with the year before. As the results of the comparison for these three departments did not indicate any appreciable change, the comparative study between the work in the prewar and the war periods was not extended to the other departments.

The comparative study in the general medical department showed (Table I) that local examination, laboratory tests, treatment, and revisits were recorded in a slightly higher proportion of cases in 1917 than in 1918. The pediatric departments recorded diagnosis and local examinations to a slightly higher extent in 1917, and in the neurological clinics, the diagnosis, general physical examination, laboratory tests, treatment, and revisits were more often recorded in 1917 than in 1918. The only marked decrease in 1918 was observed in general physical examinations in the neurological departments (52.5 per cent. in 1917; 42.4 per cent. in 1918), and in the

and the pediatric division showed in 1918 an improvement over 1917.

COMPARISON OF SPECIAL INSTITUTIONS WITH THE CORRESPONDING DEPARTMENTS OF GENERAL DISPENSARIES

A comparison of all the cases selected from the special institutions with those from the corresponding departments of the general dispensaries shows that, as a rule, the special institutions are superior in their procedures (Table II). By a juxtaposition of the data as to physical examination, laboratory

TABLE II.
SPECIAL CLINICS COMPARED WITH THE CORRESPONDING DEPARTMENTS OF THE GENERAL DISPENSARIES.

Departments	No. of Cases	Physical Examination Recorded		Laboratory Tests		Treatment Recorded		Patients Making More Than One Visit	
		No.	%	No.	%	No.	%	No.	%
CASES IN SEQUENCE.									
Pediatric—									
Spec...	100	66	66.	21	21.	88	88.	66	66.
Gen...	398	234	58.7	38	9.5	275	69.1	168	42.2
Neurological—									
Spec...	102	101	99.	27	26.5	66	64.7	39	38.2
Gen...	247	133	53.8	27	10.9	185	74.9	94	38.
Dermatological—									
Spec...	67	12	17.9	1	1.5	64	95.5	41	61.3
Gen...	333	151	45.4	19	5.7	281	84.5	118	35.4
Orthopedic—									
Spec...	322	153	47.7	71	22.2	252	78.6	113	35.3
Gen...	140	77	55.	27	19.3	90	64.3	33	23.6
Gynecological—									
Spec...	154	123	79.8	24	15.6	119	77.2	87	56.5
Gen...	437	231	52.8	41	9.3	183	41.8	89	20.3
Eye, Ear, Nose and Throat—									
Spec...	394	143	35.7	24	6.1	229	58.2	130	33.
Gen...	695	241	34.6	11	1.6	341	49.1	134	19.3

tests, treatment and revisits, it is found that the special pediatric, gynecological, and eye, ear, nose and throat institutions are better in all respects than the corresponding departments of general dispensaries; the special orthopedic institutions are better in all respects but physical examination, and the special neurological clinics in all but the recording of treatment. The special dermatological institution studied was an exception to the rule, the cor-

TABLE I.
COMPARISON OF WORK DONE IN 1917 AND 1918 IN THE GENERAL MEDICAL, PEDIATRIC AND NEUROLOGICAL DEPARTMENTS OF GENERAL DISPENSARIES

	No. of Cases	Diagnosis Recorded		Physical Examination				Laboratory Tests		Treatment Recorded		Patients Making More Than One Visit	
		No.	%	General		Local		No.	%	No.	%	No.	%
General Medical—													
1917.....	848	372	43.8	365	43.	192	22.6	187	22.	672	79.3	354	41.7
1918.....	926	414	44.7	407	43.9	197	21.3	153	16.5	712	76.9	903	33.3
Pediatric—													
1917.....	159	117	73.6	54	34.	28	17.6	11	6.9	101	63.5	61	38.3
1918.....	189	138	73.	65	34.4	33	17.4.	15	7.9	128	67.7	75	39.6
Neurological Department Including Neurological Institute—													
1917.....	232	178	76.7	122	52.5	44	14.6	45	19.4	181	78.	98	42.2
1918.....	217	161	74.2	92	42.4	42	19.3	39	18.	166	76.5	80	36.4

frequency of revisits: in 42.4 per cent. of the neurological cases more than one visit was made in 1917 and in only 36.4 per cent. in 1918. For the following items the records were better in 1918: general physical examinations and the noting of diagnoses in the general medical departments; general physical examinations, laboratory tests, treatment and revisits, in the pediatric departments, and local examinations in the neurological clinics. On the whole, the departments of general medicine and of neurology were slightly better in 1917 than in 1918,

responding departments of the general dispensaries excelling the special institution in the record of physical examinations and laboratory tests, but were inferior as to the noting of treatment and revisits. One reason for this is the fact that the special institution under consideration does not treat syphilis in the skin department, and this condition usually calls for more laboratory tests and physical examinations than the other conditions cared for in the dermatological departments. Syphilis, however, was treated in many of the dermatological depart-

ments of the general dispensaries which were compared with the special institution.

When groups of selected cases of a certain disease, obtained from the special departments of the general dispensaries, such as otitis media, conjunctivitis, eczema, malnutrition and lacerated perineum, were compared with similar selected cases from special institutions, the special institutions excelled only in some points and fell below in others (Table III). Laboratory tests were noted more often in the general dispensaries for conjunctivitis, eczema, and lacerated perineum and cervix, and in the special institutions for otitis

found to vary greatly in their procedure, the three departments, general medicine, pediatrics and neurology, treating a large proportion of systemic conditions, constituting one group, and the surgery, gynecology, orthopedics, dermatology, and eye, ear, nose and throat departments, treating more local conditions, falling into another. The former group recorded general physical examination, laboratory tests and revisits in a higher proportion of cases, and the latter local physical examination and diagnosis. As to the recording of treatment no definite classification can be established.

DIAGNOSIS.

Diagnosis was found recorded for a relatively high proportion of cases in all departments, but in a much higher percentage of instances in other departments than in general medicine, where the diagnoses were stated on only 43.9 per cent. of histories. The skin clinics led in this respect, diagnosing 95.5 per cent. of cases; the orthopedic departments were next in order of excellence, with 94.5 per cent., and the ear, nose and throat, with 93.4 per cent. of records diagnosed. From seventy to eighty per cent. of the cases studied were diagnosed in the surgical, neurological, eye and pediatric departments, and 63.4 per cent. of those in the gynecological clinics.

One reason for the low proportion of cases diagnosed in the general medical departments is no doubt the fact that often the conditions referred to this department are obscure and having no definite pathology are difficult to classify. The converse of this explains why the orthopedic and ear, nose and throat departments have diagnoses recorded in such a high percentage of cases. In order to be referred to a special department, a condition must be more or less localized, and consequently of a more definite nature than one treated in the general medical department.

Furthermore, it must be noted that in giving credit for the recording of diagnosis in this survey, anything written on the history form in the space for diagnosis was accepted, irrespective of other considerations. This meant giving no credit in cases where a physical examination recorded on the history made the diagnosis apparent, and accepting

TABLE III.
COMPARISON OF LABORATORY TEST, PHYSICAL EXAMINATION, TREATMENT, AND REVISITS FOR SELECTED DIAGNOSED CONDITIONS.

No. of Cases	Physical Examination		Laboratory Tests		Treatment Record		Patients Making More Than One Visit	
	General	Local	No.	%	No.	%	No.	%
	No.	%	No.	%	No.	%	No.	%
Conjunctivitis—								
Spec... 84	..	..	7	8.3	1	1.2	25	29.7
Gen... 170	..	..	53	31.	6	3.5	58	34.
Otitis Media—								
Spec... 65	..	..	23	35.3	3	4.4	55	84.4
Gen... 87	..	..	57	65.	1	1.1	72	82.5
Eczema—								
Spec... 29	..	..	3	10.3	..	..	29	100.
Gen... 241	9	3.7	128	53.1	11	4.5	208	86.3
Lacerated Pelvic Floor and Cervix—								
Spec... 52	3	5.8	47	90.5	3	5.8	48	92.5
Gen... 211	2	.9	180	85.3	24	11.4	143	67.7
Malnutrition—								
Spec... 17	11	64.6	11	64.6	3	17.3	16	94.1
Gen... 162	69	42.6	54	33.4	27	16.7	138	85.1

media and malnutrition. The recording of revisits was the only feature in which the special institutions excelled for all the selected conditions compared. In this item, the advantage was very much on the side of the special institutions, which showed revisits for nearly twice as many cases as did the general dispensaries. On the whole, the special institutions were somewhat superior to the corresponding branches of general outpatient clinics.

COMPARISON OF DIAGNOSTIC, THERAPEUTIC AND SUPERVISORY PROCEDURES FOR SEQUENCE CASES BY DEPARTMENTS.

In the analysis of medical work, the most important comparison, of course, is that relating to

TABLE IV.
COMPARISON OF CONTENT OF RECORDS REGARDING DIAGNOSIS, EXAMINATION, LABORATORY TESTS, TREATMENT AND REVISITS, TABULATED BY DEPARTMENTS

Departments	No. of Cases	Diagnosis Recorded		Physical Examination				Laboratory Tests		Treatment Recorded		Patients Making More Than One Visit	
		No.	%	General		Local		No.	%	No.	%	No.	%
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
General Medical	1774	786	43.9	772	43.5	389	22.	340	19.3	1384	78.	663	37.5
Pediatric	498	365	73.3	199	40.	141	28.3	59	11.7	363	72.9	234	47.
Neurological	349	267	76.5	164	47.	79	22.6	54	15.5	251	71.99	133	38.1
Surgical	946	755	79.9	15	1.6	266	28.1	78	8.3	431	45.6	253	26.7
Skin	400	382	95.5	15	3.7	148	37.	20	5.	345	86.2	159	39.7
Orthopedic	462	436	94.5	51	11.	183	39.6	98	21.2	342	74.	146	31.6
Gynecological	591	375	63.4	17	2.9	342	57.8	65	11.	302	51.	176	29.8
Eye	548	420	76.7	12	2.2	269	49.	17	3.1	410	74.8	153	27.9
Ear, Nose and Throat	541	505	93.4	3	.5	115	21.2	18	3.3	160	29.6	111	20.5
General Total for all Departments	6309	4291	68.	1248	19.7	1932	30.6	749	11.8	3988	63.1	2028	32.2

the general diagnostic and therapeutic procedures (Table IV). This comparison has been made on the basis of the sequence cases studied in the various departments of the general dispensaries and of special institutions. The several departments have been

comparatively blank record forms containing a single word in the diagnosis space, even when this word was merely a symptom, such as constipation or nervousness. This is one reason why the proportion of cases diagnosed in some of the departments of

the several dispensaries does not always correspond with the proportion of diagnostic procedure indicated.

PHYSICAL EXAMINATION.

The three departments treating the larger proportion of systemic conditions, the general medical, pediatric, and neurological, all recorded a very much higher percentage of general physical examinations than the departments treating conditions which are more local in their nature, but even the former departments indicated general physical examination for less than half of their cases. The proportions of general physical examinations recorded in the different departments are as follows: neurological, 47 per cent.; general medical, 43.5 per cent.; pediatric, 40 per cent.; orthopedic, 11 per cent.; dermatological, 3.7 per cent.; gynecological, 2.9 per cent.; eye, 2.2 per cent.; surgical, 1.6 per cent.; ear, nose and throat, .5 per cent.

When the fact is considered that patients are referred to special departments, as a rule, without any previous physical examination to ascertain whether or not there are present deficiencies other than the one for which special attention is being sought at the time, the very small proportion of general physical examinations noted for the patients in the special departments demonstrates one of the weak points of the present dispensary system.

Local physical examination, as would be expected, was found recorded much more often in the departments treating local conditions than in the other divisions, although the ear, nose and throat and surgical departments exhibited histories less satisfactory in this respect than those from the other special departments. The proportions of local examinations stated in the different departments were as follows: Gynecological, 57.8 per cent.; eye, 49 per cent.; orthopedic, 39.6 per cent.; dermatological, 37 per cent.; pediatric, 28.3 per cent.; surgical, 28.1 per cent.; neurological, 22.6 per cent.; general medical, 22 per cent.; ear, nose and throat, 21.2 per cent.

LABORATORY TESTS.

The three departments treating mainly systemic conditions recorded laboratory tests, including skiagraphs, for a larger proportion of cases than did any other special department except the orthopedic, although histories from all the departments showed the laboratory to have been used for only a small proportion of cases. The percentage of cases recorded as having received laboratory, including röntgenographic, diagnosis from each department was as follows: Orthopedic, 21.2 per cent.; general medical, 19.3 per cent.; neurological, 15.5 per cent.; pediatric, 11.7 per cent.; gynecological, 11 per cent.; surgical, 8.3 per cent.; dermatological, 5 per cent.; ear, nose and throat, 3.3 per cent., and eye, 3.1 per cent. The high score in this procedure in the orthopedic departments was due chiefly to the large proportion of radiographic examinations recorded in these departments.

TREATMENT.

Treatment was recorded for less than three fourths of the patients from every department except general medicine and dermatology, and the line of cleavage between departments caring for systemic disease and those treating local conditions

is not visible here as it is in certain other respects. The treatment accorded the patient was recorded in the following proportions of cases in the different departments: Dermatological, 86.2 per cent.; general medical, 78 per cent.; eye, 74.8 per cent.; orthopedic, 74 per cent.; pediatric, 72.9 per cent.; neurological, 71.9 per cent.; gynecological, 51 per cent.; surgical, 45.6 per cent.; ear, nose and throat, 29.6 per cent.

REVISITS.

As indicated by the recording of revisits, the following departments, all treating a large proportion of chronic cases, excelled in supervision of patients: the pediatric, with this information in 47 per cent. of instances; the dermatological, giving it in 39.7 per cent.; the neurological in 38.1 per cent.; the general medical in 37.5 per cent., and the orthopedic in 31.6 per cent. of cases. The other departments recorded revisits for less than 30 per cent. of cases, in the following proportions: gynecological, 29.8 per cent.; eye, 27.9 per cent.; surgical, 26.7 per cent.; ear, nose and throat, 20.5 per cent. The relative excellence of the pediatric departments in this respect reflects, no doubt, the influence of the class plan of organization as applied to cardiac and malnutrition cases.

GENERAL CONTENT OF RECORDS.

The general content of records, as shown by the average for all departments, is most inadequate. Diagnosis and treatment were recorded for only about two thirds of all patients (68 per cent. and 63.1 per cent., respectively); local examinations and revisits for less than one third (30.6 per cent. and 32.2 per cent.); general physical examination for less than one fifth (19.7 per cent.), and laboratory tests for only about one tenth, or 11.8 per cent. of all patients.

COMPARISON OF DIAGNOSTIC PROCEDURE FOR SELECTED DIAGNOSED CONDITIONS.

Altogether, 2,716 selected diagnosed records were studied, and those refer to bronchitis, chronic nephritis, rheumatism, chronic valvular heart lesions, and gastric ulcer, from the general medical departments; rickets and malnutrition, from the pediatric departments; syphilis of the nervous system and epilepsy, from the neurological departments; fracture and cellulitis, from the surgical departments; eczema, from the dermatological departments; lacerated perineum and gonorrhoea, from the gynecological departments; conjunctivitis, trachoma, and otitis media from the eye, ear, nose and throat departments, and syphilis and gonorrhoea from the genitourinary departments. The tuberculosis cases were omitted from this study because of certain data missing, but a special comparison with the other clinics is given in the special tuberculosis study published in the March, 1920, issue of the *American Review of Tuberculosis*.

Lungs.—Examination of lungs was recorded much more often for the conditions treated in the general medical departments than in any other. It was found recorded for 55.4 per cent. of all cases of bronchitis; 48 per cent. of cases of chronic valvular heart lesions; 46 per cent. of cases of chronic nephritis; 37.3 per cent. of cases of chronic rheu-

matism, and 26.4 per cent. of those of gastric ulcer. The only other disease with a high proportion of lung examinations was rachitis, for which this procedure was noted in 36.8 per cent. of instances.

Heart.—The examination of the heart was recorded for a relatively large proportion of cases for all conditions, and especially for the following diseases treated in the medical departments: chronic heart lesions, 84.9 per cent.; chronic nephritis, 60.7 per cent.; chronic rheumatism, 45.3 per cent.; bronchitis, 38.2 per cent., and gastric ulcer, 25.6 per cent. The only other diseases where examination of the heart was noted in a large proportion of cases were: rachitis, with this item on 38.5 per cent. of the histories studied: syphilis, with it recorded in 12.5 per cent., and syphilis of the nervous system, having it stated in 10.1 per cent. of instances.

Abdomen.—Examination of the abdomen was recorded most often for the diseases treated in the general medical and pediatric departments. This information was given on the following proportions of histories of the conditions stated: gastric ulcer, 58.1 per cent.; heart lesions, 38.8 per cent.; rachitis, 38.5 per cent.; nephritis, 33 per cent.; malnutrition, 34 per cent.; bronchitis, 17.6 per cent.; rheumatism, 16 per cent.

Genitourinary examination.—Genitourinary examination was noted for only six of the diseases studied: 85 per cent. of cases of lacerated perineum; 21.1 per cent. of gonorrhoea patients; 4.1 per cent. of syphilis; 2.4 per cent. of epilepsy; .9 per cent. each of rheumatism and heart lesions.

Muscles and bones.—Examination of muscles and bones was recorded more often for rachitis (in 73.7 per cent. of instances) than for any other condition. This information was noted on the histories of 50.7 per cent. of the fracture cases; 18.6 per cent. of cases of chronic nephritis; 17.3 per cent. of cases of chronic rheumatism, and eleven per cent. of cases of malnutrition.

Skin.—Examination of the skin was recorded for 53.1 per cent. of patients treated for eczema. Case histories of cellulitis and syphilis also had examination of the skin recorded for a large number of cases—in 30.9 per cent. and 23.4 per cent. of instances, respectively.

Nervous system.—The cases of syphilis of the nervous system studied were given an examination of the nervous system in 79.7 per cent. of instances. The other diseases for which such examinations were recorded were: epilepsy, with this procedure stated for 24.3 per cent. of cases; chronic nephritis, with it recorded in 13.7 per cent.; chronic rheumatism, in 12.9 per cent.; syphilis, in 12.5 per cent.; malnutrition in 8.2 per cent., and heart lesions, in 7.7 per cent. of instances.

Special senses.—An examination of the special senses was also recorded for a very high proportion (79.7 per cent.) of cases of syphilis of the nervous system. Such examination was also noted for a large number of cases of conjunctivitis (65.5 per cent.); trachoma (60 per cent.); otitis media (31.1 per cent.) and primary and secondary lues (21.8 per cent.).

Glands.—Examination of glands was recorded for only eight of the diseases studied, and

for a very small proportion of cases of each of these conditions except malnutrition, for which this item was noted on sixteen per cent. of histories.

Teeth.—Teeth were examined for a relatively high proportion of patients treated in the general medical departments and for malnutrition. The cases diagnosed as rheumatism received the most attention in this respect, such examination being recorded in 26 per cent. of instances. It was also reported for 22.5 per cent. of cases of nephritis; for 20 per cent. of cases of malnutrition; for 16 per cent. of heart lesions; 10.6 per cent. of bronchitis, and 6.8 per cent. of cases of gastric ulcer studied.

Throat.—Examination of the throat was recorded about as often as was examination of the teeth, but for twice as many cases of malnutrition as of chronic rheumatism. The conditions receiving the largest proportions of throat examinations were: malnutrition, 20 per cent.; nephritis, 18.6 per cent.; chronic heart lesions, 16.6 per cent.; bronchitis, 14.4 per cent.; rheumatism, 10 per cent.; otitis media, 8.2 per cent.; rachitis, 7 per cent., and syphilis, 6.7 per cent.

Tongue.—The condition of the tongue was noted most often for the disease treated in the general medical and neurological departments. This information was noted for chronic nephritis in 7.8 per cent. of instances; for syphilis of the nervous system in 7.2 per cent.; for heart lesions in 5.5 per cent.; for bronchitis in 5.3 per cent.; for epilepsy in 4.8 per cent., and for malnutrition in 4.7 per cent. of cases.

Temperature.—Temperature was recorded for a larger number of cases of malnutrition (27.6 per cent.) than of any other condition. This item was also recorded on the histories of heart lesions in 26.4 per cent. of instances; for chronic nephritis in 20.5 per cent.; for bronchitis in 16.6 per cent.; for rachitis in 15.8 per cent. and for rheumatism in 14 per cent. of instances.

Pulse.—Pulse was noted for cases of heart lesion in a larger proportion of instances (35.6 per cent.) than for any other disease. This item was recorded, however, for 19.7 per cent. of cases of nephritis; for 14 per cent. of cases of rheumatism; for 8.6 per cent. of cases of malnutrition, and for 7.7 per cent. of those of bronchitis.

Respiration.—Respiration was noted for only six of the various conditions studied; 23.5 per cent. of cases of chronic nephritis; 22 per cent. of chronic valvular heart lesion; 4.9 per cent. of bronchitis; 3.8 per cent. of malnutrition; 2.6 per cent. of chronic rheumatism, and .4 per cent. of eczema.

Weight.—Weight was recorded for only seven of the different conditions studied, as follows: 16 per cent. of cases of malnutrition; 12.7 per cent. of nephritis; 8.9 per cent. of rheumatism; 7.7 per cent. of heart lesions; 5.1 per cent. of gastric ulcer; 3.8 per cent. of bronchitis, and .5 per cent. of syphilis. The instance last noted was the only case where weight has found recorded outside of the general medical and pediatric departments.

Blood pressure.—Blood pressure was never found recorded, except in the general medical and pediatric departments, and for only a small percentage of

the diseases treated in these departments, with the exception of nephritis, for which this procedure was noted in 17.8 per cent. of instances; rheumatism, for which it was stated for 7.3 per cent. and heart lesions, for 5 per cent. of instances.

General physical examination.—By far the more adequate general physical examinations were recorded in the general medical, pediatric, and neurological departments, which, as has been emphasized heretofore, treat conditions systemic in nature. Very little physical examination was noted on the histories from the surgical departments, or for gonorrhoea, whether treated in gynecological or genitourinary departments. The eye, ear, nose and throat departments also had little record of physical examination, except of the special senses. Of all the items of physical examination stated for the various diseases studied, examination of the heart was recorded for the largest proportion, 20.8 per cent. of all the cases. The lungs, also, were examined in a relatively high proportion of all cases, 18.3 per cent.; the abdomen in 12.6 per cent., the skin in 10.7 per cent., and the special senses in 10.4 per cent. of instances. All other divisions of physical examination were recorded for less than 10 per cent. of cases: temperature; pulse; examination of teeth, throat, genitourinary tract, muscles and bones, nervous system, all for between five and ten per cent. of patients whose histories were analyzed; while examinations of tongue, glands, weight, blood pressure and respiration were recorded for less than four per cent. of cases.

Of all the conditions studied gonorrhoea, as indicated by the records, would seem to have been given the least of general physical examination, as on 77.5 per cent. of case histories of this condition, examination was not noted. Likewise, 68.8 per cent. of cases of otitis media, 68.1 per cent. of cellulitis, 58.5 per cent. of epilepsy; 49.2 per cent. of fracture, 48.4 per cent. of syphilis, 46 per cent. of eczema and 40 per cent. of trachoma had no physical examination recorded. The diseases accorded the highest proportions of physical examinations were: syphilis of the nervous system, for which some examination was recorded for all but 10.1 per cent. of cases; heart lesions, for which this item was noted for all but 11.4 per cent., and lacerated perineum, all but 14.6 per cent. of which were examined.

LABORATORY TESTS.

Uranalysis.—In accordance with natural expectation, the analysis of urine for sugar and albumin was recorded for a higher proportion of cases of chronic nephritis than of any other condition and that was in only 39.2 per cent. of the cases. This procedure was noted for 12.8 per cent. of cases of heart lesions; for gastric ulcer in 11.1 per cent.; for rheumatism in 9.7 per cent. and for epilepsy in 4.9 per cent. of instances. Microscopic uranalysis was recorded more often for gonorrhoea than for chronic nephritis, this item being noted in 44.9 per cent. of cases for the former and 37.2 per cent. for the latter condition. The other diseases having this procedure noted in a relatively high proportion of cases were, heart lesions, 10.5 per cent.; rheumatism, 10.4 per cent.; gastric ulcer, 6 per cent., and epilepsy, 4.9 per cent.

Skiagraphic examination.—An x ray examination was recorded on some proportion of the histories of all diseases studied except eczema, conjunctivitis and trachoma; and for a relatively higher proportion in cases of fracture (56.7 per cent.) and of gastric ulcer (45.3 per cent.) than in others. The patients with chronic nephritis had röntgenographic examination recorded in 7.8 per cent. of instances; those with rheumatism in 6 per cent.; those with rachitis in 5.3 per cent.; and those with other conditions all in proportions less than 5 per cent.

Wassermann test.—Although the Wassermann test was noted for a slightly higher proportion of cases than was the x ray examination, the application of the former was more restricted, as four conditions (fracture, cellulitis, conjunctivitis, and trachoma) had no record of this procedure. As would be expected, syphilis and syphilis of the nervous system received this examination most often—in 67.2 per cent. and 78.2 per cent. of cases respectively. The only other condition having this item noted for more than the average number of cases was epilepsy, with the Wassermann test recorded for 12.2 per cent. of cases.

Blood examination.—A blood count or hemoglobin test was noted much more often for cases of gastric ulcer, being recorded in 11.1 per cent. of instances, than for any other condition. Blood examination was entered on the histories of 3.6 per cent. of cases of malnutrition, and in nephritis for 2.9 per cent., in heart lesions for 1.8 per cent., in syphilis of the nervous system for 1.4 per cent.; and in syphilis, rheumatism and bronchitis, each for less than one per cent. of the cases studied.

Analysis of sputum.—Analysis of sputum was recorded for only six of the conditions studied, as follows: for bronchitis in 7.8 per cent. of cases; for gastric ulcer in 3.4 per cent.; for nephritis in 2 per cent.; for heart lesions and malnutrition, each in 1.8 per cent., and for rheumatism in .7 per cent.

Other laboratory tests.—A Von Pirquet test was recorded for 8.6 per cent. of cases of malnutrition, 1.8 per cent. of heart lesions, .8 per cent. of eczema and .3 per cent. of bronchitis. Smear was noted for 34 per cent. of the patients with gonorrhoea; 2.3 per cent. of those with heart lesions; 1.9 per cent. of those with lacerated perineum; 1.1 per cent. with conjunctivitis, and .5 per cent. with syphilis. A complement fixation test was recorded for 4.8 per cent. of cases of epilepsy, .7 per cent. of rheumatism and .5 per cent. of eczema. Spinal puncture was noted on the case histories of only three conditions—21.7 per cent. of the cases of syphilis of the nervous system; 5.1 per cent. of cases of gonorrhoea, and 1.6 per cent. of syphilis. Stools were examined for blood in only one case of gastric ulcer. A test meal was noted on the records of but two conditions: for 37.6 per cent. of the cases of gastric ulcer and for .9 per cent. of patients with heart lesions.

GENERAL COMPARISON

Laboratory tests were recorded as having been employed much more often for the diseases treated in the general medical departments than for those from the other clinics. Of all the laboratory tests for the conditions discussed, x ray examination and the Wassermann test were stated to have been used

for the highest proportion of cases, 9.5 per cent. and 9.6 per cent. respectively. Microscopic uranalysis was noted for 6.6 per cent. of cases; analysis of urine for sugar and albumin for 5 per cent.; smear for 2.3 per cent.; and test meal, examination of stools, hemoglobin and blood count, sputum, Von Pirquet, complement fixation tests and spinal puncture investigations for only small proportions of cases (less than two per cent.).

The diseases for which the highest proportions of laboratory tests were recorded were: syphilis of the nervous system, which had this procedure noted in some form for 84 per cent. of cases; syphilis, with tests recorded in 67.2 per cent. of instances; nephritis and gonorrhoea, with this information on 66.7 per cent. of case histories for each; gastric ulcer in 59 per cent., and fracture in 56.7 per cent. of instances. No laboratory tests whatever were recorded for the cases of trachoma studied; 98.8 per cent. of the cases of conjunctivitis; 96.5 per cent. of cases of otitis media; 98.2 per cent. of cases of cellulitis; 95.4 per cent. of cases of eczema, and 93.2 per cent. of rachitis, received no laboratory tests.

The highest proportion of any laboratory test for a given condition was 78.2 per cent. of Wassermann reaction for syphilis of the nervous system. The following conditions all received laboratory tests in a high proportion of cases: syphilis, 67.2 per cent. of Wassermann; fracture, 56.7 per cent., and gastric ulcer, 45.3 per cent. of x ray; gonorrhoea, 44.9 per cent. of microscopic uranalysis; nephritis, 39.2 per cent. of uranalysis for sugar and albumin and 37.2 per cent. of microscopic uranalysis; gastric ulcer, 37.6 per cent. of test meals and gonorrhoea, thirty-four per cent. of smears.

CONCLUSION.

The foregoing analysis speaks for itself. The dispensaries and out patient departments of hospitals evidently do not utilize sufficiently their opportunities for the application of accurate methods in diagnosis and treatment. An improvement in these respects and in the general adaptation of the dispensaries to the functions they are intended to fulfill is much to be desired in the interests of both medical advancement and public health.

LONDON LETTER.

(From our own correspondent)

British Association for the Advancement of Science.

LONDON, September 4, 1920.

On August 24, 1920, the eighty-eighth annual meeting of the British Association for the Advancement of Science opened at Cardiff, Wales, and was well attended by British men of science and oversea visitors. The president for the year is Professor W. A. Herdman, professor of oceanography in the University of Liverpool. The association was founded at York in 1831 as a result of the efforts of Sir David Brewster and can point to a great past, when men like Humphrey Davy, Herschel, Playfair, Hurley, Lyndall, Kelvin, Clark Maxwell, Abel, Vernon Harcourt, Murchison, and a host of others were the shining lights in the sci-

entific firmament. The association generally deals with questions of medical interest, and the meeting this year is no exception to the rule.

Professor Karl Pearson, in his presidential address before the Section of Anthropology, impressed upon his audience that anthropology must be pursued on broader lines if it were to yield more useful results to mankind. He confessed that perhaps he was a scientific heretic in that he did not believe in science for its own sake but for man's sake. What, he asked were anthropologists doing during the war with their own science? The whole period of the war produced the most difficult problems in folk psychology. There were occasions innumerable when thousands of lives and heavy expenditure of money might have been saved by a greater knowledge of what creates and what discourages folk movements in the various races of the world. India, Egypt, Ireland, even our present relations with Italy and America, showed only too painfully how difficult we found it to appreciate the psychology of other nations. We would not surmount these difficulties until anthropologists took a wider view of the material they had to record. It was not the physical measurement of native races which was a fundamental feature of anthropometry today; it was the psychometry and vigorimetry of white as well as of dark skinned men that must become the main subject of study. Anthropology should be made a wise counsellor of the state, a counsellor in political, commercial, and social matters. "I will not," said Professor Pearson, "go so far as to say that if the science of man had been developed to the extent of physical science in all European countries, and had then had its due authority recognized, there would have been no war, but I will venture to say that the war would have been of a different character and we should not have felt that the fate of European society and European culture hung in the balance, as at this moment they certainly do."

The man of today is precisely what his past history and his prehistory have made him. It is impossible to build your man for the future until you have studied the origin of his physical and mental constitution. Whence did he draw his good and evil characteristics? Are they the product of his nature or his nurture? Man has not a plastic mind and body which the enthusiastic reformer can at will mold to the model of his golden age ideals. He has taken thousands of years to grow into what he is, and only by like processes of evolution, intensified and speeded up, if we work consciously and with full knowledge of the past, can we build his future. It does matter in regard to the gravest problems before mankind today whether our ancestry was hylobatic or troglodyte. If the spirit of violence be innate in man, if there be times when he not only sees red but rejoices in it, and that was the strong impression I formed when I crossed Germany on August 1, 1914, then outbreaks of violence will not cease till troglodyte mentality is bred out of man. That is why the question of troglodyte or hylobatic ancestry is not a pursuit of dead bones. It is a vital problem on which turns much of folk psychology. It is a problem utile to the state."

Editorial Notes and Comments

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DISORDERLY ACTION OF THE HEART.

During the war disorderly action of the heart was greatly in evidence and the condition was closely studied. Much useful knowledge on the subject has been accumulated which should be and no doubt will be of much service in medical practice, as it must be borne in mind that this symptom complex is by no means confined to those who have served in the army. Dr. W. I. Ritchie read a paper on prognosis in certain affections of the heart before the Medico-Chirurgical Society of Edinburgh on July 7, 1920, published in the *Lancet* on September 25th, in which he refers at some length to disorderly action of the heart. He pointed out that when the man who was always a weakling, unfit to play games at school, and who found the true level in a quiet, sedentary, unambitious walk of life, attempts to undertake larger responsibilities, he becomes incapacitated by the giddiness, fatigue, palpitation, precordial pain, and other symptoms characterizing this disorder. This type of person will never become robust, but those in whom the disorder has arisen as a sequel to shell concussion, or in civil life to some other form of trauma, may be expected to improve slowly under judicious treatment.

After excluding this group of cases, and those in whom is found viscerotoposis, obesity, arterio-sclerosis, early pulmonary tuberculosis and hyperthyroidism, Ritchie states that in over forty per cent. of these patients there is evidence of some

recent infection, and in an additional ten per cent. there is anemia, presumably of toxic origin. In all these cases, fifty per cent. of the total, the prognosis, in Ritchie's opinion, is good. In fact it is not the heart that is primarily at fault. Therefore do not give a guarded prognosis and coddle the patient. A good prognosis is the first essential in restoring the patient's confidence. He should be told that there is little the matter with him, not be allowed to remain in bed, nor waited upon more than is absolutely necessary.

At first massage and passive exercise are of value and when he has begun to walk he should be encouraged to undertake an increasing amount of physical exercise daily. He should soon be taking active exercise out of doors. Drugs are seldom indicated and digitalis is wholly useless. In the army this mode of treatment was remarkably successful. However, in civil life the prospects of good recovery are not so uniformly good. The patient does not lead such a healthy life as does a soldier; he is less amenable to control. Physical training under skilled supervision is costly, and not so efficient as in the army; there are devoted relatives whose influence is the reverse of helpful, and in certain grades of the community there is the sure expectation that incapacity for work will be compensated by grants from public funds. Yet, with all these drawbacks, Ritchie assures us that brilliant results may be obtained, and a man or woman who has been practically bedridden for months may, within a few weeks, be leading an active and useful life. It is also instructive to learn that the cases in which the dominant manifestations are those of neurasthenia are the most intractable and the most prone to relapse.

The diagnosis of heart disease, or rather the differential diagnosis of organic and functional heart disease, is a matter concerning which the general practitioner often knows little. Gross lesions he is able to detect, but the more subtle forms of heart disorder he is likely to pass by or to magnify greatly. This inability to diagnose correctly was shown over and over again during the war when men were labelled as having heart disease, who on examination by really experienced physicians were found to be practically sound in this respect.

To Sir James Mackenzie is chiefly due the honor of demonstrating how to diagnose affections of the heart and how to treat them. There is no doubt that Ritchie is right in recommending that a good prognosis should be given in these cases and that the patient should take

regulated physical exercise. Sane and rational ways of treating heart disorders have happily come into vogue based, of course, on correct diagnosis. It is obvious that in order that correct diagnosis may be arrived at the medical student and practitioner must be well trained in modern methods of diagnosis and treatment.

PHYSICIAN-AUTHORS: JOSIAH GILBERT HOLLAND

The medical profession is not always a royal road to wealth. This is not an exciting bit of news. A number of physicians have, from time to time, had more than a suspicion of the fact. In sooth, there have been authentic instances where physicians have considered it necessary to abandon the profession to keep body and soul together—an extreme measure that reflects only on the resourcefulness of the physician. There is the case of Dr. Josiah Gilbert Holland. Whether it was youthful impatience, or injudicious location, or some other reason, is not known, but Dr. Holland became discouraged after about two years' practice and returned to other pursuits. He had studied four years at the Berkshire Medical College, at Pittsfield, Mass., receiving his degree in 1844, and entered practice at Springfield, Mass.

Holland did not immediately return to editorial work and literature, in which field he became a best seller. He spent a few months as a country school teacher and traveling daguerreotypist and got his first taste of journalism as publisher of the *Bay State Weekly Courier*. The *Courier* failed in a few months and he went to Richmond, Va., to teach school. He seemed to have been fairly well launched on a career as an educator, for his next position was as superintendent of the public schools of Vicksburg, Miss., but in 1849 he got an opportunity to join the staff of the Springfield, Mass., *Republican*, and accepted it. His writings, mostly under the pseudonym of Timothy Titcomb, were largely responsible for putting the *Republican* in the front rank of American newspapers. In time he became part owner of the *Republican* and in 1866 sold his interest for fourteen times as much as he had paid for it. He then took a long vacation in Europe and it was there he planned a new monthly magazine, originally known as *Scribner's Monthly* from which has grown the *Century Magazine* of today. Holland was the editor of the magazine from its establishment until his death.

As a writer Holland was preeminently a moralist. With him literary work never was a matter of art for art's sake. His was the rôle of uplifter. Because of this lack of literary finish his work

was freely criticized. Reviewers fell upon him mercilessly, but that fact did not deter the less fastidious public from buying his books by the hundreds of thousands. Perhaps the most popular of his prose was the novel *Seven Oaks* and his most popular verse the long narrative poem, *Bitter Sweet*, which James Russell Lowell called "an obstinately charming little book." "We mean it as very high praise," said Lowell, "when we say that *Bitter Sweet* is one of the few books that have found the secret of drawing up and assimilating the juices of this New World of ours." *Kathrina*, another of Holland's long poems, was a close rival of Longfellow's *Hiawatha* in its day. Today it is almost unknown.

It was Holland's poetry that drew most of the fire of the critics. The *New York Sun* had dubbed him "the American Tupper," for like Tupper (Martin Farquahar Tupper, an English writer who was at the time an object of great derision) he did much commonplace moralizing. The Tupper designation clung to him the rest of his life and hurt him deeply. Edward Eggleston, author of *The Hoosier Schoolmaster*, described Dr. Holland as a man of dignified and impressive presence, "a man of rare simplicity who loved approbation and craved affection." To such a man the undisguised sneers of the reviewers were gall in his cup of happiness over large sales. But though the judgment of the critics was against his writings, there was none that failed to recognize the charm of his personality and Richard Watson Gilder and Edmund Clarence Stedman, among others, felt the loss of him so keenly that they inscribed poems to his memory.

Besides *Bitter Sweet* and *Kathrina*, Dr. Holland's poetry also included *Garnered Sheaves*, a collection of shorter poems; and *The Puritan's Guest* and *The Mistress of the Manse*, lengthy poems of early New England life. His novels, in addition to *Seven Oaks*, included *Miss Gilbert's Career*, *Nicholas Minturn*, *Arthur Bonnicastle* and *The Bay Path* all of which had New England settings and all of which were greatly popular. His novels were undoubtedly his best work, artistically considered. He also published several books of shorter prose writings, the inspirational nature of which may be judged from their titles—*Letters to the Young*, *Gold Foil*, *Plain Talks on Family Subjects* and others. He also wrote *The Life of Abraham Lincoln*, of which nearly 200,000 copies were sold. Holland also was a popular lecturer on social topics and took an active part in the civic life of New York. In 1872 he was appointed a member of the city board of education and later became president of the board. He also was chairman of the board of trustees of New York University. He died suddenly in New York

on October 12, 1881, at the age of sixty-two, having been born on July 24, 1819, at Belchertown, Mass. Death came as he was busy writing an editorial on poverty as a means of developing character. The editorial, half finished, was based on the lives of Presidents Lincoln and Garfield. The latter, a personal friend of Holland, had just died as the result of wounds inflicted by the assassin Guiteau.

TORSION OF THE SPERMATIC CORD.

Among the clinical lesions of the testicle resulting from morbid changes in its vasculonervous pedicle torsion of the cord is paramount. In order that the testicle can twist on the cord the gland must plunge in the vaginalis as the heart does in the pericardium, that is to say, an embryonal defect exists having as a consequence the absence of the mesorchium, the testicle being suspended like a cherry on its stem. In these circumstances a strain or violent movement will cause torsion of the pedicle with the resulting clinical phenomena. Vanverts was able to collect only forty-four reported cases to which he added one of his own and after clinical and experimental researches on the subject he came to two conclusions different from those of his predecessors which relate to the evolution and surgical treatment of the lesions. According to the opinion of most observers, torsion of the cord almost invariably results in suppuration and septic gangrene of the structures involved. Now Vanverts maintains that these phenomena only occur when there is a superadded infection and the aseptic focus that the testicle represents after its own circulation has been cut off should not be any more exposed to infection than would be a subcutaneous hematoma. For this reason Vanverts believed that recovery with simple atrophy of the testicle without suppuration is the rule both in man and animals.

The experiments undertaken to demonstrate this special viewpoint were positive and conclusive in this respect, so that Vanverts has been led to regard the testicle as being much less compromised in its vitality after torsion of the cord than is generally admitted unless an infection becomes superadded. Too much importance must not be attributed to the vascular lesions. Some observers—Volkman, Miflet, Neumann, and English—have recorded curious instances of hemorrhagic gangrene of the testicle without torsion of the cord including them either among cases of torsion of the testicle or among those of primary phlebitis or arteritis of the vessels of the cord. In fact torsion and phlebitis often coexist as in Bevan's case of gangrene of the testicle in which the phlebitis of the spermatic veins of an ectopic testicle was most manifest. The venous coagulum being filled with

bacteria, while torsion of the cord was distinctly made out. In Nicoladom's case the veins were completely occluded and the artery partially so. This was likewise the condition found by Keers and Langlet in their cases.

Unquestionably, the effects of torsion vary according to the presence or absence of blood infection and comparatively with Chauveau's researches, it may be admitted that in many if blood infection does not preexist or follow, torsion ends in simple atrophy of the testicle. Although not denying the frequency of phlebitis and venous and arterial thromboses following torsion there is reason to ask whether or not among these cases some were not in reality simple primary phlebitis and venous and arterial thromboses with a torsion more apparent than real and Scheeds has remarked that torsion of the testicle may merely be a secondary symptom and not the cause of necrobiosis of the testicle which often takes place spontaneously. But if we consider only simple cases it appears evident that when no infection exists the morbid changes arising in the testicle can only be attributed to some mechanical factor. If torsion causes a complete occlusion of the elements of the cord the surgeon in some cases provokes the same condition of affairs with no untoward results to the testicle.

Lucas-Championniere excised the cord in eight cases of operation for large inguinal hernia and eight cases of operation for large inguinal hernia and the operation in no way affected the testicle although the gland was deprived of its excretory duct and arterial supply. The gland at first swelled and was painful but the tumefaction soon retrogressed and never completely atrophied. Carlier is also of the opinion that an aseptic total excision of the cord does not necessarily result in necrosis of the testicle and absence of atrophy may, in some cases, be attributed to anastomoses of the arteries of the cord with the arterial circulation of the bursæ.

These results conflict with the findings in atrophy of the testicle sometimes occurring rapidly after operations for varicocele in young adults or in cases of hernia where the spermatic artery has been divided unintentionally. This may be due to absence or insufficiency of the collateral circulation in youth—as in the case of dogs—hence the necessity of maintaining a more complete arterial irrigation of the testicle in young people than those of advanced years. The age of the patient, the individual differences in the blood supply and the length of time the patient is followed after operation must all be taken into consideration. When this is done sufficiently numerous and careful histological examinations will then have some real value.

BASAL PNEUMONIC RESIDUES IN CHILDREN.

It is a well known fact that after children have been suffering from pneumococcal infections of the lungs they fail to recover completely, and also measles, whooping cough, influenza, especially in mouth breathers, and in rickety, badly nourished children, frequently leave a bronchopneumonic condition which may be overlooked. In *Tubercle*, September last, Dr. Walker Overend urges a more frequent radiological examination of the chest in children who have undergone attacks of any of these infections. He points out that many of the physical signs simulate those of tuberculosis, and that if there should be a clear family history of tuberculosis, the diagnosis of phthisis may be hastily made by the medical attendant or by the school medical officer, and the child sent to the tuberculosis dispensary for further observation or for sanatorium treatment.

It is shown that Sutherland and Jubb examined the sputum of 230 children under suspicion of tuberculosis during the period April, 1911, to October, 1912; they found only nine per cent. were positive. In the sputum of these children the pneumococcus constituted the most abundant organism. According to Overend the following statements seem justifiable: 1. Many cases of illhealth after pneumonia and infectious disease among children are due to unresolved pneumonia produced by a chronic pneumococcal infection, and are not tuberculous. 2. Bronchiectasis of the internal moiety of the lower lobe, or of the whole lobe, is more likely to follow attacks of chronic or indurative basal pneumonia; disseminated patches of bronchopneumonia are more likely to produce areas of diffuse bronchial dilatation. 3. After removal of enlarged tonsils and adenoids, the expediency of surgical intervention should again be discussed if the lower lobe alone is solid, honey-combed with bronchiectasis abscesses and dilated bronchi, and also accompanied by symptoms of septic absorption.

JACOB'S LADDER.

The harassed municipal surgeon must sometimes wish an exact account of Jacob's ladder had been given, for he has to contend with accidents brought about by faultily constructed ones which, breaking, twisting, slipping, falling, hurl a workman to destruction. Then follow the loss of time or life to the worker, surgical assistance, sick allowance or pension, witnessing in the courts, and all this procedure brought about by faulty ladders or, very often, by thoughtless or daring men. People who view lofty buildings under construction little know that so great is the risk run by workers that Rule 1222 of the Industrial Commission says that none but skilled workmen who thoroughly understand the

dangers shall build the scaffolding whose faulty construction may lead to accidents on ladders, etc. Another worry coming to the municipal surgeon is the "contributory negligence" one. The men will slide down levels, jump from higher levels, even consider the ladders installed as a reflection on their agility, or say they breed habits of carelessness. Distinct specifications are made for the making of ladders, but, we fear, faults creep in even as in airplane building. To reduce the 1,000 accidents which occur almost yearly would be encouraging because they do not include many scaffolding accidents.

DISCARNATE SPIRITS.

In these days, when every morning there are paragraphs concerning those who have slipped out of the back door of Life by means of knife and rope, gas fumes, poison, it may be consoling to relatives who are burdened not only with grief but shame, to learn from the spiritists that there are not only good spirits, but weak ones, hovering around, working us evil, though well meaning. These discarnate spirits believe it is sad sometimes that human souls must tarry in this world when everything is against them. They long to have them enjoy the larger, freer life. If one of these spirits becomes attuned to a weak or diseased mind, it may suggest suicide, but purely from a desire to help. Suicides are generally deemed irresponsible. This theory confirms it; but one reluctantly admits the invading of our borderland by weak minded spirits. Devils and angels we know, but how are we to discern these others?

News Items.

International Congress Against Alcoholism.—The fifteenth International Congress against Alcoholism was held in Washington, D. C., September 21st to 26th.

Anniversary of Ether Day.—The seventy-fourth anniversary of Ether Day will be observed with suitable exercises at the Massachusetts General Hospital, on Monday, October 18th. The address will be delivered by Dr. Alonzo E. Taylor, of the University of Pennsylvania.

Insanitary Jails.—The New York City Police Department plans to abandon many of the jails in the police stations as the conditions have been shown to be insanitary and inadequate. Many improvements are contemplated and it is thought that \$500,000 will be required to make the necessary changes.

Aged Count a Ship's Surgeon.—Count Eugene Gerard Fraysses is the surgeon on the Fabre liner *Asia*. He is seventy years old and a veteran of the Franco-Prussian war of 1870. He also served in the recent war and has received many decorations, including that of commander of the Legion of Honor.

A Tuberculosis Preventorium in Grand Rapids, Mich.—The tuberculosis preventorium established by the Antituberculosis Society of Grand Rapids, Mich., was thrown open for inspection on September 19th. It has accommodation for twenty-five patients.

Yellow Fever in Mexico.—Yellow fever is reported to be spreading in Mexico. A press dispatch quotes official statements to the effect that there are 100 cases in Vera Cruz and between thirty-five and fifty in Tampico and that the epidemic has spread to other cities.

Vacancies in the Social Hygiene Board.—The United States Civil Service Commission announces examinations for several vacancies in the United States Interdepartmental Social Hygiene Board, for duty in Washington, D. C., and in the field. For full particulars regarding these examinations address the Commission, Washington, D. C.

Poliomyelitis Commission in Massachusetts.—A commission has been appointed at Harvard University to investigate the outbreak of poliomyelitis in Massachusetts, consisting of Dr. Milton J. Rosenau, professor of preventive medicine, Dr. Robert W. Lovett, professor of orthopedic surgery, and Dr. Francis W. Peabody, professor of medicine.

Mental Clinic for Children.—A free mental clinic for children was opened at St. Joseph's Hospital, New York, on Wednesday afternoon, October 13th. This clinic is equipped to examine and advise both in cases of mental disease and mental defect, and is under the direction of a psychiatrist from the Hudson River State Hospital, assisted by a psychometric examiner from the State Commission for Mental Defectives.

China Medical Missionaries Meet.—The following officers were elected by the China Medical Missionary Association at its annual meeting in Peking in February, 1920: President, Dr. C. F. Johnson, of Tsinan; vice-president, Dr. Thomas Gillison, of Tsinan; executive secretary, Dr. R. C. Beebe, of Shanghai; recording secretary, Dr. H. H. Morris, of Shanghai; editor of *China Medical Journal*, Dr. E. M. Merrins, of Shanghai.

Antinoise Campaign.—Dr. Royal S. Copeland, Health Commissioner of the City of New York, from a study of the existing conditions has been convinced that certain classes of industry should be prevented from encroaching upon residential sections in order that the residents be protected from the noise which they produce. Hucksters, rattling automobiles and the clatter of dishes in restaurants tend to increase the din. In this way the health of the community is affected.

Personal.—Dr. Fred H. Albee, of New York, was the guest of the Chicago Medical Society at a banquet given at the University Club on Wednesday, October 6th. Later Dr. Albee delivered a lecture on Osteoplastic Surgery, which was illustrated with lantern slides.

Dr. J. Lewis Amster has been appointed consulting surgeon of the penitentiary and correctional hospitals of New York City.

Smallpox on Ocean Liner.—The Holland-American liner *Nieuw Amsterdam*, which arrived in New York on October 12th, from Rotterdam, with 621 cabin and 1,673 steerage passengers, was detained in quarantine by the Health Officer of the Port on account of a case of smallpox in the steerage. The *Nieuw Amsterdam* will be detained at quarantine indefinitely with the 1,673 steerage passengers on board.

Gives American Hospital to Italy.—A children's hospital has been offered to Italy by the Committee on the American Tribute to Italy. It will be called the International Child Welfare at Rome.

British Surgeon Brings Gift.—Sir Berkeley Moynihan, who recently left England to attend the convention of the American College of Surgeons in Montreal, brings with him the silver mace which is the gift of the consulting surgeons of the British army and is a memento of the assistance they received from American colleagues during the war.

Red Cross Medical Personnel in Europe.—The Red Cross medical report for July, 1920, shows ninety-six physicians, nine dentists, ten pharmacists and one laboratory man, making a total of 116 medical personnel in Europe. This number, however, has been cut rapidly by the expiration of contracts so that there are now only about fifty medical men still in Red Cross service in Europe.

Serum Treatment of Appendicitis.—According to press dispatches, Professor Pierre Delbet, of the University of Paris, announces the successful treatment of appendicitis by an antigangrenous serum, instead of by operation. Professor Delbet is reported to have said that the tests have extended over a period of thirteen years and the results have been satisfactory.

University of Paris.—A diploma of radiology and radiotherapy has been instituted by the medical faculty of the University of Paris. M. Gosset, professor of external pathology, has been named for the chair of the surgical clinic to replace M. Quénu, retired. M. Vaquez, professor of internal pathology, has been named for the chair of the therapeutic clinic in place of M. Robin, retired.

A Typhus Hospital in Poland.—At the request of the League of Red Cross Societies a large hospital for research work in typhus fever will be operated in connection with the American Red Cross Hospital at Wilno. For the last two years hospitals in northern and eastern Poland have been overcrowded with typhus fever patients, and in localities where the hospital service was inadequate whole communities have been wiped out.

Red Cross Society Establishes a Health Service.—The American Red Cross Society announces the establishment of a department of health service and an extension of its nursing service. The organization has 36,000 nurses on its rolls working in more than 15,000 communities. In order to increase the number of qualified public health nurses 288 scholarships have been established and 67 loans have been made from the national fund, and in addition approximately 250 scholarships have been awarded by the various chapters.

Public Lectures on the League of Red Cross Societies and the League of Nations.—Professor F. F. Roget, of the University of Geneva, will deliver three public lectures in London on October 18th, 25th, and 29th. The first lecture will be on the League of Nations and the League of Red Cross Societies, the second the declaration of the five national delegations sitting in conference at Cannes will be considered, and the third will deal with the program of work laid down for the medical department of the League of Red Cross Societies.

Leprosy Committee in Philippines.—Dr. Vicente de Jesus, acting director of health of the Philippines, has appointed a Leprosy Investigation Committee to meet at Manila from time to time for the purpose of undertaking investigations in connection with the treatment of leprosy. The committee consists of Dr. José P. Bantug, Philippine Health Service, chairman; Dr. H. W. Wade, University of the Philippines, pathologist and Bureau of Science; Dr. Liborio Gomez, Bureau of Science, bacteriologist; Dr. Daniel de la Paz, University of the Philippines, pharmacologist; Dr. Granville A. Perkins, Bureau of Science, chemist; Dr. Proceso Gabriel, Philippine Health Service, and Dr. Luis Guerrero, University of the Philippines, clinicians.

American Scientists to Explore Amazon Basin.—A party of American scientists, headed by Dr. H. H. Rusby, dean of the College of Pharmacy, Columbia University, are planning an expedition to South America early next year for the purpose of studying medicinal plants, insects and animals, with the hope that discoveries of economic value may be made. Search will be made for supplies of certain drugs now in use and for others not now known to science, and several new drugs will be investigated. About one thousand miles of the Amazon Basin in Eastern Ecuador and Peru will be explored. The expedition is to be financed by the H. K. Mulford Company, of Philadelphia, and is called the Mulford Biological Exploration of the Amazon.

Tuberculosis Conferences.—The North Atlantic Tuberculosis Conference held its seventh annual meeting in Richmond, Va., last week, with delegates in attendance from eight states. Dr. Thomas J. Riley, general secretary of the Bureau of Charities, Brooklyn, presided at one of the sessions and presented a paper dealing with the service in Brooklyn on behalf not only of tuberculosis victims but also of crippled children and the blind. Dr. Louis I. Harris, of the New York health department, was also present and presented a paper on Tuberculosis as an Industrial Problem.

The Southern Tuberculosis Conference met in Jacksonville, Fla., October 11th to 13th, with state health officers from Mississippi, Georgia, Kentucky, and Florida in attendance.

Meetings of Local Medical Societies.—The following local medical societies will meet during the coming week:

Monday, October 18th.—New York Academy of Medicine (Section in Ophthalmology); Medical Association of the Greater City of New York; Psychiatric Society of Ward's Island; Yorkville Medical Society.

Tuesday, October 19th.—New York Academy of Medicine (Section in Medicine); Federation of Medical Economic Leagues of New York.

Wednesday, October 20th.—New York Academy of Medicine (Section in Genitourinary Diseases); Geriatric Society; Medicolegal Society; Northwestern Medical and Surgical Society; Alumni Association of the City Hospital.

Thursday, October 21st.—New York Academy of Medicine (stated meeting); New York Celtic Medical Society.

Friday, October 22d.—Academy of Pathological Science; Audubon Medical Society; New York Clinical Society; Society of Alumni of Sloane Hospital for Women; Brooklyn Society of Internal Medicine.

Saturday, October 23d.—Lenox Medical and Surgical Society; New York Medical and Surgical Society; West End Medical Society.

First Aid on Pullmans.—The Pullman car service is giving the American Red Cross first aid training to the entire force of colored maids employed on the transcontinental trains. Several of the women have already finished the course and now carry as part of their equipment the regulation first aid kit. The Pullman Company has arranged with the New York County chapter of the Red Cross to give the course of training in first aid and home hygiene to some hundreds of maids reporting to its New York terminal.

Indiana State Medical Association.—The annual meeting of this society was held in South Bend, September 23d to 25th, under the presidency of Dr. Charles H. McCully, of Logansport. The following officers were elected: President, Dr. David Ross, of Indianapolis; first vice-president, Dr. Hugh J. White, of Hammond; second vice-president, Dr. Ira M. Washburn, of Rensselaer; third vice-president, Dr. Otto R. Spigler, of Terre Haute; secretary-treasurer, Dr. Charles N. Combs, of Terre Haute (reelected). The next annual meeting will be held in Indianapolis, September 27 to 29, 1921.

Died.

BIGELOW.—In Island Falls, Me., on Sunday, September 26th, Dr. Frederick F. Bigelow, aged sixty-two years.

CARROLL.—In Brooklyn, N. Y., on Saturday, October 2nd, Dr. Edward J. Carroll.

CLARK.—In Staten Island, N. Y., on Tuesday, October 5th, Dr. Frederick E. Clark, aged seventy-three years.

CLAY.—In Malta, Mont., on Sunday, September 5th, Dr. George W. Clay, aged forty-seven years.

CONNORS.—In Boston, Mass., on Tuesday, October 5th, Dr. Willett Spurgeon Connors, aged fifty-one years.

D'AQUIN.—In New Orleans, La., on Wednesday, September 8th, Dr. John Joseph d'Aquin, aged forty-eight years.

DUPEE.—In Bridgeport, Conn., on Wednesday, September 29th, Dr. Edward Wilson Dupee, aged forty-eight years.

ELLINWOOD.—In Rome, N. Y., on Friday, October 1st, Dr. Eliza Maria Ellinwood, aged seventy-one years.

GIBBONS.—In Stockton, Cal., on Tuesday, September 21st, Dr. William Edward Gibbons, aged seventy-five years.

GRAHAM.—In Little Falls, N. Y., on Saturday, September 25th, aged thirty-six years.

HARRIS.—In Atlantic City, N. J., on Wednesday, October 6th, Dr. Robert Edward Harris, aged thirty-nine years.

HICKS.—In Menominee, Mich., on Sunday, September 26th, Dr. Walter Raleigh Hicks, aged fifty-five years.

HOWELL.—In Cogan Station, Pa., on Tuesday, October 5th, Dr. William M. Howell, aged seventy-three years.

HUHNER.—In New Orleans, La., on Friday, September 10th, Dr. George Huhner, aged seventy-one years.

LARKEY.—In Oakland, Cal., on Sunday, September 26th, Dr. Alonzo S. Larkey.

MAXSON.—In Berkeley, Cal., on Sunday, September 26th, Dr. Harriet S. Maxson, aged fifty-one years.

MCDONALD.—In Coblenz, Germany, on Wednesday, October 6th, Dr. James Wilson McDonald, of Fairmount, W. Va., aged fifty-nine years.

ROTHWELL.—In Denver, Col., on Tuesday, September 7th, Dr. Edwin J. Rothwell, aged seventy-eight years.

ROWE.—In Boston, Mas., on Saturday, September 18th, Dr. Anna Forrest Rowe, of Brooklyn, aged sixty-three years.

Book Reviews

NEW BOOKS ON THE TUBERCULOSIS PROBLEM.

The Shibboleths of Tuberculosis. By MARCUS PATERSON, M. D.; Medical Superintendent, Metropolitan Asylums Board, Colindale Hospital; Late Medical Superintendent, Brompton Hospital Sanatorium, Frimley; Medical Director, King Edward VII Welsh National Memorial Association; Resident Medical Officer, Brompton Hospital, London. New York: E. P. Dutton and Company, 1920. Pp. ii-239.

A Study on the Epidemiology of Tuberculosis. With Special Reference to Tuberculosis of the Tropics and of the Negro Race. By GEORGE E. BUSHNELL, Ph.D., M. D., Colonel, United States Army, Medical Corps, retired, Honorary Vice-President and Director of the National Tuberculosis Association of the United States. Illustrated. New York: William Wood and Company, 1920. Pp. v-221.

The reviewer remembers an English doctor bringing charts and views of Frimley Sanatorium to Johns Hopkins Medical Society and giving an address on that which was novel and giving good results in the treatment. He was very convincing and many were convinced.

Only the enthusiastic, the really dutiful, will be grateful to Dr. Marcus Paterson of Frimley for airing and making a clean sweep of erroneous statements, false doctrines of which his work there and elsewhere has taught him the pervasion and evil. He finds about fifty-nine, so imagine the nuisance and mess he creates pulling them down, but he does not believe in patching up or compromising because these statements were once believed in by great men in medicine and are still believed by the laity.

To give the first shibboleth will show that the others are clear and well put. It is, Why sterilize milk and neglect butter and cheese? These also could be purchasable. The English and American Public Health service have both demonstrated tubercle bacilli in cheese two months old and in butter ninety-nine days old.

Then, having reviewed the fifty-nine, he says what he has found:

That open air treatment and homes for tuberculosis are not sanatoria. A "little gardening" is neither graduated labor nor autoinoculation, which latter is a natural method of treatment, and inoculation tests of sputum and blood should always be made when microscopic examinations yield negative results. Practically all cases of pleurisy or hemoptysis are due to tuberculosis. That it is better to test by exercise. That climate, if not actually unsuitable, has little to do with treatment. That our treatment of those carrying sputum flasks is unreasonable: a man with one is a safer neighbor than one who uses his handkerchief. Also that patients may have bacilli free sputum.

Finally, Nageli has shown that large numbers have recovered from tuberculosis without their being aware they had it. This is an indication of an increasing high natural resistance to the disease, and a proper appreciation of autoinoculation would be of infinite value to the state. Too much attention is given to the value of physical signs at rest, disregarding tests by graded exercise.

He draws a good picture of the (English)

apathy. Confronted with an undeniable fact that tuberculosis is preventable, he supposes a Great Britain practically free, then allowing a weekly shipload of one thousand, or, practically, fifty-two thousand, which is about the annual mortality, to land there. Every step necessary to see that it did not take root would be made as rapidly as if fighting an Asiatic plague.

He makes some remarks on the qualifications of a medical superintendent of a sanatorium. "The patience of Job and a capacity for working twelve hours a day, seven days a week." Walther, of Nordrach, touched the bedrock of successful treatment when he said it was not the buildings of the sanatorium, but the man in charge. The idea of any open air place where patients do as they like and are overfed being called a sanatorium is absurd. The patients generally become fat, neurotic and selfish.

The book is so lucid and instructive that it deserves more space than can be given. It gives much food for reflection—reflection that must lead to determined action against the enemy.

The reviewer came across an epitaph on the grave of a Dr. Moses Little (1766-1811). The whole family died of tuberculosis, but Dr. Marcus Paterson would most probably say ignorance.

"Phthisis insatiabilis

Patrem, matremque devorasti

Parce! O parce liberis."

but the children died shortly after their parents.

* * *

There is a certain amount of usefulness in carefully retelling and explaining what everyone knows, because there never was a greater fallacy than that everyone does know. But when to common information is added some carefully trimmed ideas which tell of great consideration of the subject, the small audience who took back seats that they might more easily escape, will be reinforced and give good attention. The man on the platform says that to understand tuberculosis of the temperate zone and of our race, we must know also how it affects other races, but the epidemiological data are little known and are often in inaccessible periodicals. He undertakes to tell us all about them and therein lies the attraction of his book. He has on his mind the great prevailing ignorance of the disease as it affects races as yet not fully tuberculized, and wants to help doctors who meet the disease in far away countries, though he admits the difficulty of getting facts and will not condescend to use airy statements however impressive. He thinks the von Pirquet test will become increasingly important, not only in the tropics but also at home, and recommends the wider study of tuberculosis, not only in large cities but in such places as Samoa and Porto Rico, where the date of introduction is comparatively recent.

Dr. Bushnell pursues the enemy all over the world asking, When did it come? How did it come? He divides the countries into two classes and finds the law of Römer holds good: That where it is a rare disease the cases are acute and fatal: Where common, it is chronic and, relatively, benign. That is,

contact affords a certain protection. This was proved by the fine work of von Pirquet and others working with the tuberculin reaction, who proved that, in European cities at least, the adult population was thoroughly tuberculized. We comprehend this in reading of such races as the Marquesas (South Seas) about whom Buisson says that the population will soon disappear. The tribe of Hapaa is said to have numbered 400; first smallpox reduced them by one fourth, then tuberculosis exterminated them save two. The natives of Tierra del Fuego once numbered 5,000; of these, barely 300 remained in 1910. The natives say that, before the whites came, people only died of old age.

As a note of cheerfulness in this mortuarial information, we are told that tuberculization sets in—that is, unless all are exterminated, when it would be superfluous! Instances of this are American Samoa, Tahiti and Hawaii. One class in all communities, the children, are always exposed to primary tuberculosis, and the urgency of a determined fight by undermining ignorance and securing sanitation is inestimable.

The chapter on the American negro and the American Indian is full of interest, also the one on Epidemics of Tuberculosis and Prophylaxis of the Nonimmunized. It would be difficult to comment fully on the book. For to do so would mean a larger quotation than space allows. The author does not claim original investigation, but he may rightly claim originality in putting old facts in a new light.

DIAGNOSIS OF CANCER

The Exact Diagnosis of Latent Cancer. An Inquiry Into the True Significance of the Morphological Changes in the Blood. By O. C. GRUNER, M. D. Philadelphia: P. Blakiston's Son & Co., 1919. Pp. v-79.

In this small monograph Dr. Gruner is careful to state that from a study of the blood alone it is not possible to secure an accurate diagnosis. However, he considers it possible to attain a fairly accurate diagnosis of latent cancer when the various data possible to secure are correlated and the proper deductions made. The essential thing to do, as he points out, is to establish the relationship between the various hemic phenomena and the underlying biological processes. He seeks primarily to establish a new concept of the interpretation of the various clinical findings. From the blood picture he shows us many deductions can be made. The drop of blood is a true sample of all the blood in the body and we are told it should serve as an index of great value. It is of interest to note that while Gruner attaches much importance to the hematology of a patient he tells us to investigate carefully the background of the patient, his home life, his business surroundings, so that we may be able to eliminate, or give full value to the functional disorders or the malfunctioning of any of the ductless glands which may have their origin in some psychic disorder.

This warning is a very healthy note in a monograph which dwells upon minuteness in diagnosis. If we can study the little things without allowing them to master us, we will be taking a long step forward in diagnostic medicine. To be sure, can-

cer is one of the most baffling diseases known to medicine and the method of approach adopted by Gruner should go far toward helping us grasp the fundamental underlying causes of this dread disease.

X RAY ATLAS

The X Ray Atlas of the Systemic Arteries of the Body. By H. C. ORRIN, O. B. E., F. R. C. S., Ed. Fellow of Royal Society of Medicine, London; Civil Surgeon Attached Third London General Hospital, R. A. M. C. (T.). Illustrated. New York: William Wood & Co., 1920. Pp. i-91.

This series of remarkable x ray plates illustrating the anatomy of the vascular system has appeared in *The Archives of Radiology*. Work of this character should lead to a revision of our study of the blood vessels, for the subject presented in this fashion gives a new concept of the arteriovenous system of the human body. A visual projection of the vascular system is made possible, especially by the use of the stereoscopic plates. New values are gained. The anastomotic and distributory elements of this vast network which reaches every cell in the body attains a new significance. We should not be led into the fallacy of allowing these x ray studies to supplant careful anatomical studies by dissection and cross section; they should rather be used as supplemental to the other studies.

The arrangement followed by Orrin is the head and neck, including the arch of the aorta, the upper extremity, the thorax, the abdomen, the pelvis and lower extremity. The work has been done with painstaking care and the result is a series of beautiful photographs. The book should be received with favor by anatomists, and surgeons in every branch of the profession.

SURGEON GENERAL STERNBERG.

A Biography of George Miller Sternberg. By His Wife, MARTHA L. STERNBERG. Illustrated. Chicago: American Medical Association, 1920. Pp. ix-331.

The best biography is one which retains its interest after many years and beguiles into reading it those who never knew the man, for none can write comprehendingly without giving the life of the times his hero lived in, and so the book becomes an interesting reference volume.

The task which lay before the author was to depict fairly a triple personality—her husband as doctor, scientist and soldier—and this has been successfully done. The fourth page finds him assistant surgeon in the U. S. Army, dodging bullets at Bull Run; then follow his work as army surgeon at many out of the way places, disease fighting being varied with natural history studies and exciting discoveries in shell mounds and ancient burial places. He could not choose his dwelling place, and it was often in an unsanitary place or where disease flourished because tolerated by ignorance or indifference. The chapter on the Nez Perces Campaign delightfully savors of Fenimore Cooper, and the reader half regrets Sternberg's transportation from Walla-Walla to the Havana Yellow Fever Commission. We who enjoy the fruits of such work can hardly imagine the hopes defeated, the toil in the laboratory, the distasteful task of refuting theories advanced by confrères, which Sternberg went through. He was certainly the pioneer bacteriologist in America. His

discovery of the pneumococcus before Pasteur is well known, and he most assuredly cleared the ground for Walter Reed's discovery. But where he cleared he also encouraged valiant scientists to walk. In his ten years as surgeon general he realized his ideal of establishing a laboratory at every military post in the country and created the Army Medical School. The Army Nurse Corps was also of his making; also the Dental Corps. Best of all, he fought that arch enemy, tuberculosis, and established a hospital at Fort Bayard and many general hospitals during the Spanish-American war, which war was begun with the usual skirmishing for obviously needed men and supplies with reactionaries at Washington, officials who could not see the economy of having medical officers fully trained in hospital war work.

One rather regrets that neat, cold tombstone at the end of the life. It has an air of finality; its very weight seems to press out any vital spark of heavenly flame; whereas George Sternberg is still living, working, in the men who desire, as he did, a happy victory over all disease.

SELFHEALTH AS A HABIT.

Selfhealth as a Habit. By EUSTACE MILES, M. A., Formerly Scholar of King's College, and Honors Coach and Lecturer at Cambridge University; Assistant Master at Rugby School; Amateur Champion at Racquets and Tennis; Author of *How to Prepare Essays*, *How to Remember*, etc. Illustrated. New York: E. P. Dutton & Co., 1919; London and Toronto: J. M. Dent & Sons, Ltd. Pp. v-341.

Some twenty years ago, right in the heart of London a new restaurant appeared. No chops or steaks or meat foods of any kind, just vegetables, cereals, fruits. The young, the faddy, the dyspeptic cautiously ventured in and looked suspiciously at the dishes offered. It was generally expected that the usual notice "This Shop to Let" would soon appear. Eustace Miles and his wife walked around among the tables with explanations vocal and printed and gently enticed people to learn a little of the insides into which they were putting the food. Last year, when on a visit to London, I found the shop still open and no new undertaking business opened nearby. Certainly the advice in this, Eustace Miles's last book, on how to eat less ought to be feverishly read in these H. C. L. days.

What is this selfhealth? A state of satisfactory well being, independent of particular surroundings. It radiates health to others. It means selfmastery, increasing intelligence. Frequently repeated deep and full breathing, simple exercises, water sipping, the avoidance of worry, the cultivation of happiness will all help. Read the chapters on Economy and Rest, Position and Expression, Better Breathing, Balanced Diets, Exercise, Hobbies, Mainly About Helping Others. Every suggestion is good and will not make one faddy or abnormally self-conscious. No expense is involved, rather less for the ordinary person, but Mr. Miles imagines a co-operation from restaurateurs, landlords, and employers which does not exist. His dietary plan, when well carried out and unstinted, is capital. But send the homeless man to a pure food restaurant and he comes away not half satisfied. With a meat

order, however small, he gets five cents knocked off soup, roll and butter for nothing, and at least one vegetable. Possibly tea or coffee is five cents cheaper also. Now at the pure food place, soup is fifteen cents, bread and butter are charged for, salad—one wilted lettuce leaf and two slices of tomato—is ten or fifteen cents, one tablespoonful of any vegetable or fruit is priced the same, and a dish—eggs, macaroni, curry—from the menu is twenty-five to forty cents, and they are so digestible that he is hungry again three hours later, not being able to afford enough.

Then life in a rooming house—the stuffy bedroom, his sitting room the streets or parks, no inclination to exercise after a ride on crowded car or a long day's work, the daily bath with a queue at the rooming house waiting to get in, the sipping of water with none save that down three flights of stairs, and a smudgy jam glass to drink from. I am not depreciating the author's advice, but simply putting in a plea for those seemingly obstinate people who do not follow his advice. The book is very reasonable and holds nothing to make a man a fidgety nuisance or to behave as though he was the only one to possess a stomach.

OSCAR WILDE.

A Critic in Pall Mall. By OSCAR WILDE. Reviews and Miscellanies. New York: G. P. Putnam's Sons. Pp. vi-290.

To judge fairly of an author's book it should first be judged as a book and the impression it creates without also judging the author. Then, in extenuation of faults, his life, education, peculiar circumstances should be weighed and his condemnation pronounced only when he has wilfully and plainly, not given his best, or when he has treated his readers discourteously by giving them ill-dressed untruths in an attempt to be witty.

Taking then this little book without regard to its author: "The reviewer unconsciously gave not only the hour he could have spared, but another two, which proved pleasant reading. Among the best of the reviews is Aristotle at Afternoon Tea and Some Literary Ladies. Yates, Swinburne and Henley come in for some rather severe criticism. Of Swinburne it has been said he was a master of language, rather, language was his master. Words dominated him, alliteration tyrannizes over him." There are some amusing accounts of Mr. Rawnsley trying to get intimate details of Wordsworth from the farm folk in Westmoreland. "He wrote poetry because he couldn't help it. He was not a man as folks could crack wi', nor not a man as could crack wi' folks."

Wilde has high praise for William Morris's translation of the *Odyssey* and for Walter Pater's *Appreciations*, which he says is "an exquisite collection of exquisite essays, of delicately wrought works of art." The *Sententiae* at the end of the book are wholesome without hurting, as good sarcasm should be.

Satire should, like polished razor keen,
Wound with a touch that's neither felt nor seen.

And the book is worth being accorded a companionship in our life because the author has given of his best and it is good.

Miscellany from Home and Foreign Journals

Nondiphtheritic Pseudomembranous Laryngitis.—R. Rendue (*Lyon médical*, March 25, 1920) reports the case of a man aged thirty-two years admitted to a hospital for what appeared to be an ordinary laryngotracheal bronchitis, with slight fever, some hoarseness, cough, and a few rhonchi and sibilant sounds. Two weeks later the patient had improved, but was still hoarse. Laryngoscopy showed a creamy, white false membrane on the anterior valves of the vocal cords, contrasting by its color with the swollen posterior valves. There was slight enlargement of the glands below the angle of the jaw. Swabbing of the cords showed that the material was actually pseudomembrane and not merely white adherent mucus. No Klebs-Loeffler bacilli could be found, but staphylococci were present. This patient never exhibited dyspnea nor signs of pseudomembranous bronchitis. He seemed but little inconvenienced and insisted upon leaving the hospital before the pseudomembrane had disappeared. Rendu notes that acute nondiphtheritic pseudomembranous laryngitis has been recognized since 1890 but occurs characteristically in children, with practically the same clinical signs as laryngeal diphtheria, and is even more serious than the latter owing to its tendency to extend downward to the entire bronchial tree.

Prophylaxis Against Infectious Diseases in the Macedonian Campaign.—Armand-Delille, Lemaire, and Paiseau (*Bulletin de l'Académie de médecine*, April 6, 1920) describe the results of the activities of the International Commission on Hygiene, originally created in 1915 by Major General Macpherson in Salonica. Although in the case of dysentery and malaria the efforts put forth came too late to do much good, the severe epidemic affections, such as plague, cholera, and typhus, were so controlled that the damage done was far less than in other armies on the Eastern front during the same campaign. As regards cholera, all the troops were systematically vaccinated, either with vaccine from the Institut Pasteur as in the French, Serbian and Greek armies or with Castellani's vaccine, as in the British army. No case of cholera developed among these armies, although a large focus of infection occurred at Koritza in the zone of occupation. Systematic vaccination of 10,000 natives was likewise carried out, rapidly arresting the epidemic. In the case of plague, a service for rat destruction and bacteriological study was set up at the French base, and succeeded in localizing the foci of infection, both at Salonica and Mytilene. Relapsing fever appeared in a rather extensive epidemic form in the native population and Greek army. Strict delousing measures prevented the spread of the disease to the Allied armies, among which only a few isolated cases developed. The measures against typhus fever included systematic delousing of the entire Serbian army brought over from Corfu. A similar service was established in the Russian brigade, in which a few fatal cases had occurred.

A Case of Meningoencephalitis Lethargica.—William W. Hala and Cyril M. Smith (*Archives of Neurology and Psychiatry*, February, 1920) report a case, clinically diagnosed as encephalitis lethargica, verified by observations antemortem and postmortem. From the clinical viewpoint the author's case was one of meningoencephalitis, with lethargy and involvement of the motor fibres of the third, sixth, seventh, tenth and twelfth cranial nerves. The etiological cause was a gram negative motile bacillus, unidentified, but probably belonging to some intermediate class of colon-typhoid-enteritidis group. Pathologically, the lesion demonstrated septic meningoencephalitis and ependymitis, with punctate hemorrhages and perivascular cell infiltration of the centrum ovale, corpus striatum and optic thalamus.

Disseminated Sclerosis due to Shell Concussion.—Ducamp and Milhaud (*Presse médicale*, May 5, 1920) report the case of a man who was temporarily buried by the explosion of a *minenwerfer*, remained deaf for two days, and then resumed his military service. One year later he felt pain in the left lower extremity, sometimes of lightninglike character, which came on with fatigue and passed off with rest. Later paralysis of the right arm and leg appeared, together with sphincter disturbances. Vision was impaired for a time. The paralysis was later partly recovered from, but the patient, on detailed examination, showed the various disorders of locomotion, motility of the upper limbs, reflex action, vision, sensation, voice and sphincters characteristic of disseminated sclerosis. A number of more or less similar cases have been recorded by other observers. The long delay between the trauma and the appearance of symptoms is ascribed to the gradual development of the central nervous lesions from the original capillary hemorrhages produced by the former in the nerve tissues.

The Tenue Phase of Plasmodium Vivax.—A. J. Chalmers and R. G. Archibald (*Journal of Tropical Medicine and Hygiene*, February 2, 1920) report a case of malaria in a British soldier, caused by two generations of plasmodium vivax, the parasite of simple tertian malaria. The patient's blood showed parasites in the peculiar tenue phase, which the authors believe to represent an attempt at asexual reproduction by fission, both simple and multiple. In one of the illustrations two parasitic rings are shown, joined by a narrow loop of protoplasm, but with only one ring provided with chromatin. Further steps are also shown, the last development depicted being one in which a single erythrocyte contains five connected rings with chromatin and one ring without chromatin. The whole process appears to be a throw back to a method of reproduction which may have been useful to some ancestor of the malarial parasites, but which is now devoid of practical importance and rarely seen. No trace of migration of the parasites could be found. The same patient afforded a good example of dermatitis scarlatiniformis due to quinine.

Mental Disorders Associated with Old Age.

Sir George Savage (*Journal of Nervous and Mental Disease*, March, 1920) discusses the medico-legal aspects of old age. Loss of memory, especially for recent occurrences, loss of self control and concentration, disturbed sleep, hysterical or emotional condition during which the individual is particularly prone to the influence of younger persons in his immediate environment, are some of the outstanding features of senile dementia. Senile melancholia is also frequent and hallucinations of smell and sight complete the list of manifestations.

A Case Presenting an Epidermoid Papillary Cystoma Involving the Third Ventricle.—Donald J. MacPherson (*Archives of Neurology and Psychiatry*, April, 1920) shows a case presenting an epidermoid papillary cystoma involving the third ventricle, the tumor probably originating either from a hypophyseal rest, or as a result of a developmental abnormality of the infundibulum. The clinical signs and symptoms of sixteen months' duration did not lead to a localization before death. Correlation of clinical and pathological findings has been complicated by the difficulty of separating local from remote and general effects and the paucity of data as to the normal physiological function of the structures involved.

Preparation of a Stable Vitamine Product and Its Value in Nutrition.—H. E. Dubin and M. J. Lewi (*American Journal of the Medical Sciences*, February, 1920) assert that they have prepared a stable vitamine product, an analysis of which shows its chief components to be calcium, expressed as calcium oxide, 10 per cent.; phosphorus, 15 per cent.; nitrogen, 3.5 per cent.; fat, 2.5 per cent.; iron, 0.3 per cent.; silicates, 5.6 per cent.; moisture, 10 per cent. The remainder goes to make up the rest of the phytin molecule—the main constituent of the product—which is a double calcium and magnesium compound of inosite phosphoric acid. It is not intended as a substitute for any method of treatment, nor is it meant to be used in infant feeding only, but is rather intended to be a valuable aid whenever its use is indicated.

Renal Calculus with Negative X Ray Findings.—A. Hyman (*Boston Medical and Surgical Journal*, July 15, 1920) tells us that negative radiographic findings in renal lithiasis are not infrequent, four such cases being observed within the period of a few months. Latent kidney stones are also not uncommon; in two cases there were no symptoms referable to the side on which calculi were found. The chemical analysis showed urates to be the predominating constituent in all four cases. The passage of a ureteral catheter unobstructed into the pelvis of the kidney does not prove the absence of a ureteral calculus. The wax tipped bougie is of value; it will every now and then demonstrate the presence of a stone when other means fail. Conservation should be the watchword in all operations upon the kidney. Nephrectomy should be practiced as a last resort, for despite negative radiograms and absence of symptoms, the opposite kidney may be the seat of calcareous disease.

Anthrax from the Shaving Brush and Primary Anthrax Meningitis.—H. W. Carey (*American Journal of the Medical Sciences*, May, 1920) tells us that a new method of anthrax transmission from the use of the shaving brush has been discovered during the war. The hair used in the manufacture of the infected brushes came chiefly from China and Siberia, to a lesser extent from the Argentine and Chicago. The hair was either not disinfected at all, or inadequately disinfected. The isolation of the *Bacillus anthracis* from the shaving brush is accomplished better by the inoculation of susceptible animals than by cultural methods. Meningitis due to anthrax may occur without any apparent point of entry. The spinal fluid is always bloody and contains the anthrax bacilli in large numbers.

The Capsule in Cataract Extraction.—Edward Jackson (*Archives of Ophthalmology*, May, 1920) says that the capsule of the crystalline lens can rarely cause any serious impairment of vision when left *in situ* after the extraction of senile cataract. Even the epithelium lining the anterior capsule is not a source of danger in this connection in senile eyes. Aftercataract is in most cases essentially composed of tissue developed from fibroblasts which reach the capsule during a period of inflammation following cataract extraction; such inflammation being especially favored by the presence of lens substance within the eye and outside the lens capsule. * Peripheral linear capsulotomy guards against the danger of such damage from the presence of lens substance in the anterior chamber quite as well as the more difficult and formidable operation of intracapsular extraction.

Foreign Body of Dental Origin in a Bronchus.—Carl Arthur Hedblom (*Annals of Surgery*, May, 1920) presents the following conclusions: 1, Aspiration infection of the lungs is most common in operations about the mouth following general anesthesia. 2, Symptoms may be immediate and continuous or there may be an intervening symptomless period of months or years. There may be no immediate symptoms. 3, The most constant and characteristic immediate symptoms are cough, dyspnea, wheezy respiration, and pain in the chest. The late symptoms in varying number and degree are those of pulmonary suppuration. 4, Late symptoms of foreign body infection often simulate phthisis, and that is the diagnosis often made. 5, Positive diagnosis rests essentially on history taking, x ray, and bronchoscopy. The history may be that of having swallowed the foreign body. 6, Bronchoscopy for diagnosis is indicated in any early doubtful case. 7, Spontaneous expulsion of small, irregular foreign bodies of high specific gravity, especially teeth, is always doubtful. Spontaneous expulsion often occurs only after an abscess has formed. 8, Bronchoscopy is the only treatment to be considered in early uncomplicated cases. In cases in which there is suppuration, thoracotomy for drainage gives the best results. 9, In fatal cases death is usually due to abscess, bronchiectasis, or gangrene of the lung, any of which may be complicated by empyema. 10, Tuberculosis may coexist with a suppurative process.

Torsion of the Left Testicle Followed by Gangrene of the Testicle and Epididymis.—R. E. Powell (*Canadian Medical Association Journal*, June, 1920) reports the case of a young man in whom, after violent gymnastic exercise, acute pain and swelling appeared within the scrotum and simulated acute epididymitis. At operation there was found torsion of the left testicle with strangulation of the vessels of the spermatic cord, which had led to gangrene of the testicle and epididymis. Castration was done and the patient recovered.

Effect of Therapeutic Doses of Mercury on the Kidneys and the Duration of Its Excretion.—L. G. Beinhauer (*American Journal of the Medical Sciences*, June, 1920) says that the excretion of calomel in ordinary therapeutic doses begins within six to twelve hours and is continued until the sixth day, depending on the size of the dose. A small dose is excreted as rapidly as a larger one, but over a shorter period of time. In so far as could be determined by the urine analysis the drug is excreted without bad effects upon the kidney.

Method of Performing External Urethrotomy Without a Guide.—G. R. Livermore (*Urological and Cutaneous Review*, May, 1920) describes his method in great detail, and then concludes that for those who do not thoroughly understand the steps of an external urethrotomy without a guide, or in cases in which there is so much scar tissue that a sound cannot be introduced to the face of the stricture, it is safer for the patient and much easier for the operator to do a preliminary suprapubic cystotomy and retrograde catheterization, thus locating the urethra behind the stricture and converting an intricate operation into a very simple one.

An Unusually Large Cyst of the Epididymis.—Abr. L. Wolbarst (*Urological and Cutaneous Review*, May, 1920) reports a case with these interesting features: The cyst was evidently purely retention in character, arising in all probability from a dilatation of a seminal tubule due to some obstruction in the vas deferens or some other portion of the excretory passages; it was unusually large in size—almost as large as a hen's egg; the blood vessels were clearly outlined on its external walls; spermatozoa were completely absent; the walls were very thin; there was no assignable cause for its development and no testicular involvement or malignant potentialities.

The Tuberculosis Problem and the General Hospital.—Max Taschman and B. Stivelman (*American Journal of the Medical Sciences*, May, 1920) say that ninety per cent. of the most competent observers in the field of tuberculosis consider it helpful and advisable to have beds set aside in the general hospitals for the purpose of study and diagnosis of cases of pulmonary tuberculosis before patients are sent away for treatment. These observers apparently mean sanatoria, for only about fifty per cent. of the large general hospitals which replied to a questionnaire have a tuberculosis service, and none of the others contemplate its establishment. The writers maintain that a tuberculosis service comprising ward and clinic in the general hospital is not only advisable but necessary.

On Deep Localization in the Cerebral Cortex.—E. G. Van't Hoog (*Journal of Nervous and Mental Disease*, April 1920) found from his researches that the supragranular layers of the larger animals consistently appeared higher than the corresponding zones in related small animals. There was, moreover, a corresponding decrease of the granular layer. The granular cells, he feels, should be considered matrix cells, not only in the fascia dentata but also in the neocortex. The supragranular cortex layers are receptor associative in accordance with Ariëns Kappers functional division, and the functional nature of the granules is also receptive and associative in the post central region.

Multiple Brain Abscesses.—Clarence C. Saelhof (*Journal of Nervous and Mental Disease*, April, 1920) describes a case of multiple bilateral brain abscesses, secondary to bronchiectasis, caused by the wedging of the lower lobe of the right lung into a pocket formed by kyphoscoliosis. As causative agents the *B. fusiformis* and anaerobic streptococci were isolated and cultivated from both the abscesses and the suppurating lung. The blood stream was considered the most probable route by which the infection travelled from its primary focus.

Determination of Magnesium in Blood.—W. Denis (*Journal of Biological Chemistry*, March, 1920) describes a method for determining magnesium in small amounts of plasma which has been adapted for use with the filtrate obtained after the precipitation of calcium in plasma or whole blood by Lyman's method. The procedure briefly consists in the removal of organic material contained in the filtrate from the calcium determination, the precipitation of magnesium as magnesium ammonium phosphate, and the nephelometric determination of the phosphate in this compound by the reagent of Pouget and Chouchak.

Human Arteriosclerosis: Some Remarks Concerning Its Etiology and Symptomatology.—George William Norris (*American Journal of the Medical Sciences*, June, 1920) leaves unsettled the question whether clinical arteriosclerosis may simply be an involutinal process, a part and parcel of aging; or of a mechanical or toxic origin. It seems to him more than likely that it will ultimately be shown to be the result of chemical changes associated with the bodily metabolism, which exert their effects upon the individual visceral, vascular and somatic cells, either directly or through the mediation of the ductless glands.

Two Cases of Fibrinous Bronchitis.—I. Chandler Walker (*American Journal of the Medical Sciences*, June, 1920) thinks that cases of fibrinous bronchitis would probably not be as rare as the literature would indicate if the sputa of patients were more carefully examined. The diagnosis is made only by the finding of long, branching bronchial casts in the sputum of patients who do not have tuberculosis, diphtheria, pneumonia, or any other primary bronchial disease. Fibrinous bronchitis is an idiopathic disease, the cause of which is unknown.

Proceedings of National and Local Societies

AMERICAN GYNECOLOGICAL SOCIETY.
*Forty-fifth Annual Meeting, Held in Chicago, May
24, 25 and 26, 1920.*

The President, Dr. ROBERT L. DICKINSON, of New York,
in the Chair.

(Continued from page 564.)

Sterility in the Female.—Dr. CHARLES G. CHILD, JR., of New York, said that in his series of cases the average period of sterility was three and one half years. In one case of seven years' duration the patient was cured in ten months. The average time from operation to the birth of the first child was 15.3 months, while seven patients gave birth within one year after operation. Seven of these patients were unconditionally sterile, due to tubal occlusion, and these subsequently bore eight children, who owed their appearance in the world absolutely to conservative surgery. These eleven women operated upon had, to date, borne sixteen living children, and eight were still in the child-bearing period. Such results as had been obtained in these cases should go far towards creating in the surgeon added respect for the art he practised, and a firmer belief in the value of conservative gynecology.

Errors in Gynecological Diagnosis Due to Misplaced Organs.—Dr. REUBEN PETERSON, of Ann Arbor, Mich., drew the following conclusions: 1. Mistakes in gynecological diagnosis arising from misplaced organs are not uncommon, as shown by the literature in which only a small proportion of such mistakes is probably recorded. 2. Such errors in diagnosis arise from either carelessness, or preconceived ideas of diagnosis whereby important facts in the history and equally important physical findings are either overlooked or ignored. 3. Such diagnostic errors can be averted by greater care in systematically considering with a free mind the facts in the case relating to the history and physical findings provided the latter are obtained through the employment of the most modern methods of examination. 4. In every case a preoperative diagnosis should be made and recorded in order to profit by mistakes revealed at the operation or autopsy.

The Gynecological Problem in Industrial Medicine.—Dr. HARRY E. MOCK, of Chicago, said that the scope of industrial medicine involved the supervision of the health of employees in industry and other problems connected with the factor of human maintenance. It included the prevention of diseases and accidents; the constant supervision of the physical conditions of the employees by medical examinations and frequent conferences; adequate medical and surgical care; industrial sanitation, and nursing service. Comprehensive medical systems had been installed in a great many of the large industrial plants of the country. Where women were employed, this health supervision had given a great opportunity to study many gynecological problems, and their effect upon the efficiency and desirability of women employees in industry. A common cause for absenteeism among women workers was dysmen-

orrhea. Personal observations of this condition among several thousand women employees in a large industry were given extending over a period of several years. Other gynecological problems met in industry included the frequency of venereal diseases among women employees where complete medical examinations of women were made; the frequency of pregnancy among girl workers and how this problem should be met; the effect of dress, diet, and habits upon the health and efficiency of women workers; the need of convalescent homes in large cities for the women workers. Industrial medicine presented a wonderful opportunity for studying certain medicosociological problems as related to the large group of employees.

The Treatment of Suppurating Wounds Following Abdominal Section.—Dr. THOMAS J. WATKINS, of Chicago, said that no sutures were removed on account of suppuration except when they cut deeply into the tissues, and no drains were inserted. No probing was permitted. Moist boric acid dressings were placed over the wound as soon as signs of suppuration appeared and were continuously applied until excessive redness disappeared. The moist dressings were used to keep the wound secretions from desiccating, thus promoting drainage. Experience had shown that a large amount of drainage would take place through very small openings when thus treated, that the drainage would be efficient, and that the suppurating surfaces, by virtue of atmospheric and intraabdominal pressure, would keep in relative apposition.

The author had used this treatment for about fifteen years and had found that the wounds healed quickly, that the treatment was painless, that the patient was not unnecessarily disturbed mentally, and that the ultimate strength of the abdominal wall was seldom injured by the suppuration. When the discharge ceased no open wound remained to heal by granulation. Antiseptic solutions were not employed as they injured the tissues more than they harmed the bacteria. Irrigations, drains and the like did much damage to the delicate tissue repair which was present in the healing wounds. Photographs were presented of wounds which had suppurated and showed no evidence that there had been any suppuration. It was not uncommon for patients who had had suppurating wounds to recover entirely, and leave the hospital at the end of the third week after operation.

A Neglected Form of Cervical Endometritis.—Dr. HENRY T. BYFORD, of Chicago, stated that as a result of acute cervical endometritis a permanent exudate was sometimes left about the internal os uteri, which for descriptive purposes he called a constriction ring, although in reality it was merely a greater thickness of the mucosa at that point. This constriction ring not only produced the characteristics of stenosis in many cases, but gave rise to the ordinary symptoms that were usually attributed to endometritis, such as backache, reflex stomach disturbances, malaise, dysmenorrhea, intermenstrual

pain, menorrhagia and sterility. The number and severity of the symptoms varied greatly in different patients, depending in part upon the interference with the patency of the lumen, the chronicity and the associated pelvic conditions, and partly upon the patient's general resisting powers and nervous habits. The diagnosis was made by means of the sound which detected a tender area at the internal os and which caused more or less bleeding. In the more chronic cases firm pressure exerted by a dilating wound produced a slight discharge of inspissated mucus which adhered to the sound. The treatment called for gradual progressive dilatation with round dilators under the strictest aseptic and antiseptic precautions, and later stimulating applications of iodized phenol. The occasional failure of an Emmet trachelorrhaphy to cure the symptoms was laid to a persistence of such an exudate at the internal os.

Hemorrhages Into the Pelvic Cavity Other Than Those of Ectopic Pregnancy.—Dr. RICHARD R. SMITH, of Grand Rapids, Mich, stated that although ectopic pregnancy was by all odds the most frequent cause of hemorrhage within the pelvic cavity, it occurred occasionally from other causes. The most frequent source of such hemorrhage was the ovary. For clinical purposes they might be conveniently divided into three groups.

1. Caused by a ruptured Graafian follicle or corpus luteum which occurred most frequently in young women, and in which the symptoms rather closely resembled an ectopic pregnancy. Many patients had been operated upon also for supposed appendicitis. Blood might be found in lesser amounts or in amounts large enough to cause grave symptoms. A microscopical examination ordinarily showed a normal Graafian follicle or corpus luteum.

2. The second group was not uncommonly designated as hematoma ovarii. Here one was dealing with a distinctly pathological condition, which might be evidenced with hematomata into the Graafian follicles, with secondary changes following in the ovarian structure. This condition was rather frequently associated with fibroids or with some inflammatory trouble with the appendages. In other cases no such association apparently existed nor was the cause clear. In young women it was sometimes the cause of severe dysmenorrhea.

3. A group of hemorrhages associated with ovarian tumors (cystic or solid) of considerable size, in which the bleeding occurred into the tumor or from it into the peritoneal cavity. Such bleeding tumors were commonly the seat of a twisted pedicle or of inflammatory adhesions; also a ruptured pedicle had been the cause.

Although the tube might on rare occasions give rise to hemorrhage without the cause being evident, in most cases the reason for such hemorrhage was apparent. A tube involved in the twisted pedicle of an appendage was a good illustration of such hemorrhages; occasionally it was found associated with the thickened tubes of an old infection. Such hemorrhages were small in quantity in the reported cases and the condition should be easily differentiated from ectopic pregnancy. Intraperitoneal hemorrhages from fibroid tumors formed a very interest-

ing group. Wallace reported seventeen collected cases and Gerstenberg one. The hemorrhage was often severe and the mortality had been very high (thirty-five per cent.). They occurred from dilated veins or from a rupture of the tumor itself.

Presidential Address.—Dr. ROBERT L. DICKINSON, of New York, stated that in all other departments of medicine and surgery the war made an inventory of men and methods. Gynecology should now conduct a complete self survey. The specialty was limited but large, the procedures being few, yet gynecological operations, as studied in clinical congresses or in daily operation notices of large cities, omitting lesser operations, were shown to comprise one fourth of surgery. Operation was required in less than one tenth of patients with disabilities peculiar to women, obstetrics being excluded. The future problems that gynecology was alone qualified to solve were considered. The first was its own portion of a standard nomenclature, whereupon the new census volume was presented. The operation nomenclature was under way. Standards were defined as the best present practice, widely studied, fairly epitomized, succinctly written down, warily applied, both flexible and progressive. There was need of taking stock of obstetrical and gynecological clinics. The lack of leaders was deplored, one cause shown by the war census being a want of hospital connection, only one medical man in twenty-eight, and one surgeon in four having such connection. Therefore, deliberate selection, training, full knowledge concerning specialists, teaching centres for the future were urged, and the carrying of obstetrical education directly to the practitioner in his own locality. Women should be given hospital opportunity, so that American women might prove themselves as good as British.

What were some of the sociological problems? Sterilization of women by simple means, with tests of tube patency; artificial impregnation; contraceptives; the definition of normal sex life; the doctor's section of sex instruction; and the extension of routine pelvic examination before marriage and the harder forms of industry. He advocated the establishment of a journal under the auspices of the society; also gynecological centres in libraries and museums, including a slide library, loan charts, and a studio. Finally, action was considered looking toward certification of specialists, such certification to hold good some ten years at a time.

The Development of Prenatal Care and Maternal Welfare Work in Paris Under the Children's Bureau of the American Red Cross.—Dr. FRED L. ADAIR, of Minneapolis, said that prenatal or antenatal care was that part of a public health program which had as an ultimate object the beneficial influencing of the health of the offspring by surrounding the mother with proper conditions during the period of pregnancy. Any complete health and social welfare program should include two public welfare activities, i. e., maternal and infant welfare, which were closely related and should be very carefully coordinated. These activities were intimately bound up with the family and concerned particularly the mother and child. While these two

subprograms were more or less closely related to all the other public welfare work, they had more points of contact with each other than with the rest of such activities. From an administrative viewpoint these two activities should be comprised in a maternal and child welfare program, but from a medicosocial viewpoint the work should be handled by experts in the different lines of work.

The objects of the maternal welfare program were: 1. To develop healthy parents, especially mothers who were intelligently trained; 2, to bring them through life to maturity capable of bearing and rearing normal children; 3, to reduce the maternal, fetal and newborn morbidity and mortality to the lowest possible level; 4, to leave the mother with a desire and capacity to bear and rear children properly in a sufficient number and of such a quality as not only to maintain the integrity of the human race, but constantly to improve its character. The family should be protected from various detrimental influences by education, legislation, and proper help and advice. This meant that each family should have a normal economic status, proper housing, good sanitary surroundings, proper advice, and care in case of physical or other needs resulting from disease, economic reverses, or distress of any kind. Some of the medical problems which vitally affected the individuals and the family were those dealing with tuberculosis and venereal diseases. These activities were very closely allied to maternal welfare work.

The legislative program included those laws which were designed to protect the family unit in health, economic independence and happiness, or to prevent any invasion by medical or social disease. The relief of social distress and disease was not less important than the cure of physical ailments and diseases. For the happiness and wellbeing which could be brought to the individual mother and those associated with her by intelligent guidance, sympathy and help were unmeasurable.

The Importance of a Followup System.—Dr. GEORGE W. KOSMAK, of New York, asked whether a recently delivered mother in either private or hospital practice was accorded as much attention in a followup sense as a patient recovering from medical or surgical illness. During the past decade the development of prenatal care might be regarded as one of the most important advances in obstetrics. In view of the tendency to injuries resulting in invalidism remaining unrecognized in the usual postpartum examination, a discharge of the patient should not be made for at least three months after the birth of the child. During this interval at least two or three examinations of the patient should be made. It was possible to treat minor traumatic and other lesions during this period and avoid later complicating conditions resulting in invalidism.

A survey of forty-eight American maternity hospitals showed that thirty-six of this number maintained some sort of followup system but in the majority of the latter the patients returned only if abnormalities developed. The admission was made by practically all observers that a followup system for obstetrical patients was not only desirable but necessary. Certain difficulties must be acknowledged

in instituting such a system but with the better education of the patient the realization of the need would become apparent to her and her family. A regularly organized postpartum clinic should be part of the equipment of every maternity hospital and in connection with the same an organization of social service workers or followup nurses to visit the patients in their homes was essential. The necessity of more prolonged postpartum observation should be included in every scheme of hospital standardization and the shortcomings of institutional work in this field applied with equal force to private patients. The advisability of some form of maternity insurance might do a great deal to obviate some of the difficulties connected with the scheme of more prolonged postpartum care of obstetrical patients.

An Analysis of the Failures in Radium Treatment of Cervical Cancer.—Dr. FREDERICK J. TAUSSIG, of St. Louis, stated that radium treatment of uterine cancer should be kept in the hands of the gynecologist rather than the röntgenologist, but such a gynecologist should seek preliminary training in the use of radium and must have continued opportunity for observation and treatment of cancer cases in order to reduce mistakes to a minimum. Good permanent results could be obtained in a certain proportion of cervical cancers with amounts of radium not exceeding one hundred to one hundred and fifty mgs. of the element, though the use of large amounts in the form of emanation would doubtless decrease complications and increase the number of cures to some degree. If possible, all necessary treatment should be given within the first six or eight week period before sclerosis had set in and rendered the cancer less accessible and the normal tissues more susceptible to injury.

Tumor filtration or light metal filtration together with intracervical application did most good and least damage; twenty-five hundred to thirty-five hundred mgs. were usually enough to give results in the favorable cases. In the absence of the Bailey bomb and large amounts of emanation, well directed and prolonged x ray from six to eight portals would usually affect the parametrial and glandular involvements. Prolonged necrosis and fistulas were due to repeated treatments, to vaginal applications and to heavy gamma radiation or to a combination of the three. Rectovaginal fistulas were more frequent and vesicovaginal fistulas less frequent after radium treatment. Operation was to be preferred in all operable cases where the patient was under thirty-five years and in the early operable cases where the patient was beyond this age. Radium was to be recommended wherever obesity, lung, heart or kidney lesions made operation difficult or dangerous, and in advanced operable, borderline and inoperable cases, but not in the advanced inoperable group with cachexia. The advanced inoperable cases had better be treated with acetone, since radium increased the tendency to fistulas and pain in most instances. These views were based on an experience extending over two and a half years in the treatment of eighty-six cases of cervical and vaginal cancer and six cases of vulvar cancer, in which radium or a combination of radium with operation was employed.

(To be concluded.)

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NATIONAL HEALTH PROBLEMS.*

By HUGH S. CUMMING, M. D.,
Washington, D. C.,

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In the last analysis most health problems are in a certain sense local problems, and the Federal Constitution, which as handed down by our forefathers I am old fashioned enough to believe is the wisest instrument of government ever devised by man, sets distinct limitations upon federal activities in public health; limitations which are apparently overlooked by many enthusiastic *workers*—and others. For such problems, I look upon the United States Public Health Service as a reserve to be called upon by state and local authorities when the forces of disease or diminished economic efficiency consequent therefrom are for any reason more than local or state authority can subdue, or in which they request federal aid and cooperation.

There are, however, problems concerning the nation's servants, be they military or civil, and problems involving foreign and interstate commerce in its broad sense which clearly require national action. There are also other problems in preventive medicine which are naturally federal in scope. In nearly every great campaign there arise crises and battle is forced at some points not of our choosing, but which require for the success of our war a temporary withdrawal or weakening of forces at points which we know are our ultimate goal. Two such crises are now before the Federal health service, both consequent upon the World War. One of these is the prevention of the introduction into America of three great epidemic diseases, typhus fever, cholera and bubonic plague.

Detailed in 1918 in charge of Service activities in Europe, with especial reference to sanitation of returning troops and the inspection of ports of Europe with reference to resumption of trade and immigration, president of the Interallied Medical Mission to Poland, the American delegate to the International Convention of Public Health, and with twenty-five years of experience at home and abroad, I may be considered a fairly competent authority, and, in my opinion, there never before has been so grave a danger of the introduction of these diseases. For six years, plague, pestilence, famine and death, the four offspring of war, have ravaged Europe. So

far as Western Europe is concerned, there was comparatively little danger to us, so long as the war conditions continued, because of the absence of trade and the constant supervision of troops, though even in Holland there was a sharp epidemic of typhus in the winter of 1918-19, and occasionally rat plague at a British port. These conditions have changed, commerce and emigration have been resumed. In central and eastern Europe, the near Orient and Mediterranean littoral conditions are more menacing. It should not be forgotten that while commerce has been resumed, war, famine and disease are still raging.

There have been for several years thousands of cases of typhus fever in Poland and elsewhere in central and eastern Europe, including ports. Much to our surprise, we found last year no true Asiatic cholera in Poland, even among the Bolshevik prisoners, among whom were Chinese, Tartars, and others from cholera areas. This year reliable information leads us to fear an epidemic in Southern Europe and the near East. The third disease, plague, is much more insidious and difficult to control. Fifteen years ago Sir Patrick Manson in my quarters at the San Francisco quarantine station predicted that within twenty years plague would be pandemic unless it could be stopped by our quarantines. We now know that plague infection may persist among rats on a vessel for months before personnel are infected. Once it obtains a foothold in a port, it may persist for years until the rat population is starved and built out, and it takes millions of dollars to accomplish this.

In every Mediterranean port visited by me from Barcelona, Spain, to Constantinople human or rat plague or both were or had recently been present; in many it was endemic. Plague, human or rat, has been occurring with disturbing frequency at British ports, as well as elsewhere, and there have recently been sharp human outbreaks in several European ports. Generally speaking, the permanent stone structure of the quays, docks, and warehouses of Europe are not conducive to a long continued epizootic among rats, but in most of our American ports wood frame wharves and warehouses are ideal harbors. The great difficulty and cost of eradicating plague from such ports has been shown in New Orleans and San Francisco. The danger from cholera carriers was shown a few years ago when the Public Health Service found carrier after carrier in emigrants arriving from Naples despite the long voyage.

*Read before the Philadelphia County Medical Society, May 12, 1920.

To lessen the danger from plague the Public Health Service is requiring periodical fumigation of all vessels and the fumigation of vessels from Mediterranean and certain other ports, while trained medical officers are now in Europe. I am glad to say that the pending Sundry Civil Bill provides for the purchase and taking over of the New York, Baltimore and Texas maritime quarantine stations. It is quite conceivable that if the present conditions abroad continue or become worse that the Federal government may deem it wise to take additional measures of safety by restricting emigration from certain dangerous areas.

I hope that our respective state and local authorities will cooperate by vigorous deratization of cities, especially ports, looking into water supplies, and the improvement of housing and public baths. It may be added that the Federal government is urging such a revision of the International Sanitary Convention of Paris of 1912, to which over thirty nations are signatory, as will insure the recognition of cholera carriers, of rat plague, and of typhus, and a reliable reporting of disease.

The second great problem consequent upon the war, thrust upon the Public Health Service, is the hospitalization and care of the sick, wounded and disabled, discharged soldiers and sailors. These men to whom the country and indeed civilization itself owe so much are primarily the wards of the Bureau of War Risk Insurance, and, after convalescence, of the Federal Board of Vocational Training, the medical staff of both organizations being furnished by the Public Health Service to whom has been assigned by Congress the care of the sick and wounded.

The duty has been a difficult one in some localities, at times almost insuperable. Generally, there were insufficient hospital facilities, especially for neuropsychiatric and tuberculous patients when the war began; there has been little construction for six years, and the normal increase of population increased the deficiency. The army took over for its emergency many civil hospitals, and such of the temporary camp and evacuation hospitals as it has not needed have been transferred to the Service, but many of them, because of location or deterioration of frame buildings, are unfit for our needs. At present, the Service has about 16,000 men in fifty-two hospitals either owned or leased by it and in about 1,800 civil hospitals under contract. The number needing hospitalization is increasing at the approximate rate of 1,200 a month. Many of the institutions now in use are unsuitable and we are constantly being pressed by civil authorities to release institutions. I sincerely hope that Congress will appreciate the necessity of appropriating sufficient money to carry out the building program presented by the Public Health Service to provide for the number of patients, approximately 35,000, which we expect to reach in three or four years.

Some public health agencies may have misgivings that this duty will absorb too much of the personnel of the Service. I think this view a narrow and erroneous one. The work in a very direct sense is largely preventive medicine and toward the public health. For example, one third of the patients are

tuberculous, one third neuropsychiatric, and taking care of the tuberculous and psychiatric among nearly five millions of our population will meet two of the nation's important health problems. Furthermore, it is hoped that many of the hospitals will become centres for the development of better means for the cure and prevention of disease.

That group of communicable diseases known as the venereal diseases has for centuries been an unsolved problem, the grave importance of which has been brought to the attention of the general public as a result of our entrance into the war. He is indeed an optimist who imagines that this very serious problem has been overcome or even that the complete solution of it has been found, but I am convinced that it is to be best found in teaching the dangers of the diseases and in religious, moral and ethical training, rather than in coercive legislation alone, though proper legislation and its enforcement are necessary adjuncts.

There are other serious questions which affect the health, efficiency and welfare of the nation, such as malaria, typhoid fever, and general rural sanitation, child hygiene, and industrial diseases, which can be met efficiently by a cooperation of the Federal, state and local authorities. It will be well to consider the main Federal governmental agency interested in and responsible for disease prevention in the United States and its relation to state and local agencies.

The United States Public Health Service has been built up on the old Marine Hospital Service. For over a hundred years it has been growing. During that time Congress has imposed one duty after another until now it practically has all of the authority of law to protect the health of the nation which under the Constitution can be granted to any Federal agency. If it had annual appropriations commensurate with the authority granted, the country could expect dividend returns in the way of disease prevention that would be astounding. Even now it has an organization and funds which are the equal of any national health agency in the world. Beginning in 1798 with a fund obtained by assessing each sailor of our merchant marine twenty cents a month, it will spend this fiscal year for health work over \$2,400,000 in addition to over \$17,000,000 on its hospital relief work for the War Risk Insurance patients and other beneficiaries of the Service.

During the war the President constituted the Service a part of the military forces and its war record is one achievement to be proud of. It detailed officers to the Army and Navy, maintained sanitary zones about the camps and cantonments of the Army and had supervision over the health of many large war industries.

Within the boundaries of the camps themselves the Army health authorities were responsible for proper hygienic conditions. In the extracantonment zones the Public Health Service, in cooperation with State and local health authorities, was responsible. Aided by funds from the American Red Cross and local authorities, the Public Health Service established complete health organizations in fifty-one extracantonment zones. In all, the Public Health Service expended \$1,201,909, the American

Red Cross \$507,000, and the States and local authorities, \$650,000. The civil population protected by these organizations was approximately three and three quarter million persons, in addition to the military population.

It is not possible in a paper of this kind to enumerate all of the work done, but to illustrate: Two thousand five hundred miles of ditches were dug and 1,200 square miles of swamp territory drained, and an antimosquito zone—one mile in width—was established around each camp. It is a well known fact that malaria, which was a serious potential disability factor about many of these camps, was practically eliminated from the soldier population, and only 3,160 cases were reported to the Public Health Service during the malaria season of 1918 among the civil population of three and three quarter million, a rate of eighty-three in 100,000. From such data as were obtainable for previous years this was a tremendous reduction in the malarial rate in these communities. These results may well be compared with those in Panama, especially since they were obtained, not under military conditions, but through the voluntary work of a civil population.

After the war Congress, in providing for the medical and surgical care of the discharged and disabled soldiers and sailors, appropriated over \$10,000,000 for hospitals for the Service and made the discharged and disabled soldiers and sailors beneficiaries of the Service. During the year the Service will spend over \$17,000,000 for the maintenance of this medical care.

The Public Health Service has an organization consisting of a bureau with seven divisions and 450 employees in Washington and a field force of 593 commissioned officers, consultants and local medical men, and 8,100 other employees. It has fifty-two hospitals either owned or leased, and contracts with about 1,800 civil hospitals; ninety-one immigration stations; ninety quarantine stations; thirty stations for investigation and prevention of disease; thirty-four states are organizing with the Service a system of morbidity reports. The Venereal Disease Division has organizations working with the health authorities of forty-seven states. Some of its medical officers are detailed to advise and cooperate with other federal agencies and state health authorities. The Federal Government is responsible for the control of international and interstate spread of disease; the state governments, for the interstate and intrastate spread of disease; the local governments, for the intercommunity and intracommunity spread of disease.

The common responsibility is the control of disease. One case of any preventable disease is a matter of joint concern for national, state and local health agencies. Disease carriers do not recognize county and state lines. Once introduced into intrastate and interstate traffic a disease may cost millions of dollars and many human lives. The rational and businesslike method of disease prevention should begin at the bedside of the first patient or before and not wait until it reaches epidemic proportions. Applying such a business principle would make it imperative that the national, state and

local health agencies work together—form a joint partnership, if you please—and each bear its proper share in the work and expense. If Congress should recognize this principle and authorize such a partnership, the amounts now spent in the cooperation with the states would have to be greatly increased and a plan or organization would have to be carefully worked out so that each party to the partnership would meet the obligations and expenditures according to their respective responsibility.

The Public Health Service, owing to its size and present position in the field of health protection, would constitute the foundation upon which to build the federal health agency in such a partnership. The other federal agencies now authorized by Congress to perform certain health functions would necessarily have to be brought into the organization and their work correlated with that of the Public Health Service, in order to constitute a smooth working machine. In state and local organizations, where there are several legally authorized agencies performing health functions, these would have to be brought together and their work also correlated.

In the formation of a partnership of this kind volunteer health agencies now organized and working in the field of preventive medicine should be recognized and made a part of the machinery, but it should be distinctly understood that such agencies are auxiliary to legally constituted health agencies. However, they could be utilized to great advantage in this partnership owing to the elasticity of organization and the possibility of utilizing funds for work not authorized by law. But in the end these volunteer agencies should be brought under either federal, state or local laws and form a legal part of the health machinery. The control of disease is a governmental function and in a democratic government all agencies should finally come under authorized legal authorities, otherwise our Government would fail to be a democracy and would be subject to control by volunteer agencies who are not directly responsible to the people.

The war experience, as brought out by the results of the physical examination of the draft boards, has so impressed the Public Health Service that it has already presented to Congress a program intended especially to meet after war health needs. The fundamental principle in this program is federal cooperation with state and local health agencies and by far the larger part of the two million dollars requested of Congress would be spent along the Lever plan of federal aid extension.

When the organization of the triple partnership is complete it must be recognized that the Federal Government would have to bear its just proportion of the expenses in the state and local health machinery of forty-eight states and over four thousand local health jurisdictions. (There are about 3,000 counties and about 1,300 cities with a population of 5,000 and over). At the conference of state and territorial health authorities with the Public Health Service, I intend to discuss the subject of federal health organization and present for discussion by that conference a definite plan which would lead to concerted action of a constructive character.

EUGEN STEINACH'S WORK ON REJUVENATION.

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While the lay press is heralding in its usually sensational manner the demonstration of the methods of transplantation of sex glands, I thought it would be interesting for the medical profession to get acquainted with the fascinating and far-reaching results of the elaborate experimental work in this field by Professor Eugen Steinach of Vienna. His researches date back many years. In 1912 he submitted for safekeeping to the Scientific Academy of Vienna the manuscript and protocols of his preliminary work on the subject in order to establish priority and to continue further research work.

In 1913, at the International Congress of Biology in Vienna he demonstrated experimentally artificial sex mutation in young female or male animals by transplantation of the opposite secretory gland (*Pubertätsdrüse*). His last and complete publication bears the title: *Verjüngung durch experimentelle Neubelebung der alternde Pubertätsdrüse* (rejuvenation through experimental regeneration of the aging interstitial gonadal gland), and was recently dedicated to Professor Wilhelm Roux of Halle on the latter's seventieth anniversary, and first published in Roux's *Archiv für Entwicklungsmechanik*, Vol. 46, 1920, and later edited in book form by Julius Springer, Berlin, 1920.

The outstanding features of his work are:

1. The conception and anatomicophysiological definition of the puberty gland (*Pubertätsdrüse*) as the internal secretory portion of the gonads. This consists of the interstitial cells in the male and of the lutein cells in the female.

2. He observed in animals with protracted rutting periods alternating stages of overdevelopment of the interstitial gland and the generative gland proper; this periodical and alternating overdevelopment occurs in the evolution of every individual, the interstitial gland predominating in infancy, attaining its maximum development at puberty and adolescence when the general growth and vital energy of the organism is also at its maximum. At this time the generative gland increases in power and both the interstitial and generative portions continue to be equally active or nearly so until climacterium sets in, after which the recession of the interstitial gland progresses rapidly and brings about all characteristics of senility. He contends that senility is not due to an ultimate using up of all organs, but to the lack of potential stimulus due to the degeneration of the interstitial gland.

3. The possibility of inducing experimentally the regeneration of the interstitial gland even after senile degeneration has taken place and all the characteristic marks of senility have appeared, in animals as well as in man. This he obtains by making use of the oscillating balance of nature in the mixed gland, by artificially inhibiting the generative portion and thereby causing a compensatory regeneration and revival of the interstitial portion, with all its rejuvenating effects, and the recession and disappearance of the characteristics of senility.

4. The means to accomplish this are: a. The simple ligation under local anesthesia of the vas deferens. This causes a regression of the generative gland and a compensatory regeneration of the interstitial portion (*Pubertätsdrüse*). A one sided operation is sufficient in all cases and has the advantage of preserving in addition the power of procreation. For obvious reasons the ligation of the fallopian tube in the female does not produce this result. b. Repeated mild exposures of the gonads to the x ray is a slower but just as effective means of obtaining the same results for both the ovary and testes. c. Finally the effects of rejuvenation may be experimentally produced—as we know—by transplantation in the old of the respective gonad of a young animal of the same species.

For the male the method of choice is the ligation of the vas deferens, for the female the x ray exposure. These are in short the fundamentals of the laborious experimental studies of Steinach and, as we see, they represent a great advance over the efforts of Brown-Séquard, Hufeland, Metchnikoff and others to fight senility.

The preliminary work leading to this subject which was done by Steinach and his coworkers on birds, insects, amphibia and mammalia has also been of late related by Paul Kammerer (1). For years Steinach has bred and raised healthy generations of laboratory animals, has studied and observed their dispositions, habits, physical characteristics in all the stages of their development with particular emphasis on sex development and characters of senility. His conclusive experiments he made on rats. He shows with an abundance of illustrations and photographs the influence of the interstitial gland on those animals. The animals which have acquired the characteristics of old age have a striking appearance: Their hair becomes bristly and sparse, they are timid and uninterested in the surroundings, the head is drooping, the spine is arched, the eyes have lost their tonus and their brightness, they do not seem to relish their food, they show loss of weight, muscular weakness, inability to climb; they don't fight other males nor pursue the females; they harbor parasites.

The same animals two weeks after the ligation of the vas deferens begin to change. They begin to pick up their heads, the eyes brighten and regain their tonus, they become lively, watchful and playful; their appetite returns; the hair begins to grow, becomes thick, soft and glossy; they gain weight, they move about with new vigor and agility, they fight other males let into their cage, they pursue and possess the female and bring forth new generations which grow up into normal adults.

This true rejuvenation is accomplished by the simple experimental procedure of ligating the vas deferens. The increased resistance to disease and actual prolongation of life of the operated animals he estimates at twenty-five per cent. After a time senescence sets in again.

The records of two men who underwent ligation of the vas are also given. One at the age of forty-four showed symptoms of premature senility, loss of weight, flabby muscles, myasthenia, senile depression, tremor and other senile characteristics. In this case complete return of vigor, alertness and

capacity for hard labor followed unilateral ligation of the vas. Another man, a merchant seventy years of age, was operated on with complete success. Two years after ligation he still enjoys the return of general muscular tonus, steady gait, good appetite, a good memory and interest in life.

In women of climacteric and postclimacteric age the beneficial effects of x ray applications for myomata and metorrhagias have been noticed by many observers. This improvement consists of general wellbeing, alertness, increased capacity for work, and was first attributed to the removal of the diseased condition. But Steinach contends that its real meaning is the warding off of senility caused by regeneration of interstitial ovarian structures.

Professor Bordier, of Lyon, also emphasizes the rejuvenating effects of the x ray applied in series. (For metorrhagias of the climacterium and for the treatment of interstitial fibroids.) After the second or third series anemic, withered complexions assume a fresh, rosy, youthful appearance. General debility and mental depression are replaced by a flourishing state of health. This is due to the fact that the interstitial portion of the ovary is not affected by the x ray; whereas colloidal-albuminoid precipitation occurs in the cells of the graafian follicles which are radio sensitive, the same as neoplastic cells. The affected cells disappear later by autolysis, menopause sets in, and the interstitial portion alone whose hormones produce the rejuvenating effect remains functioning. He has perfected a technic of application of massive doses in series which give positive results and secure protection from burns (2).

The effects of implantation are the same and according to Steinach's work the shrinking of the transplanted gland which occurs after varying periods is probably due to the atrophy of the sperm gland and should not prevent rejuvenating effects.

As we see, the experiments on men are but few. However his extensive and thorough work on animals, which is apparently beyond criticism, warrants further attempts and opens a very promising field. When the original publications of Professor Steinach's work reach this country American research workers will start control experiments.

Steinach's work aside from its applicability to senility could be made use of in the sexual neuroses. Functional impotence in man should be amenable to cure. The study of the behavior of cancerous growths in animals which have undergone ligation of the vas deferens would show how much our conception of cancerous age is worth. Arteriosclerosis may perhaps also be influenced. The much debated question of the harmfulness of masturbation may perhaps be settled in the light of Steinach's conception. The reason for the failure of the Brown-Séguard injections and of organotherapy with testicular glands becomes somewhat clearer. The manufacturers of glandular tablets may use testes of animals which have undergone ligation of the vasa deferentia with greater effectiveness; these could be used for patients unwilling to undergo ligation or x ray application.

I have based this paper on an article by Professor Wilhelm Roux, director of the Anatomical Institute of Halle, and one by Professor Dr. G. Holzknicht, chief of the Central Röntgen Labora-

tory of the Wiener Allgemeines Krankenhaus. These articles have appeared in the *Neue Freie Presse*, July 11th and 18th, and aroused the interest of the world in Professor Steinach's work. They were published as an appeal for the endowment of the Biological Laboratory of the University of Vienna.

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HEMORRHOIDECTOMY.

By E. JAY CLEMONS, M.D.,
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Before proceeding with an anorectal surgical operation it is necessary to make a proctoscopic examination. Instruct the patient to take no laxatives, to eat as usual, to take a tub bath the night before, and to have dry toast and black coffee for the previous meal. Prepare the patient for operation by administering a two quart cold water enema. With hemorrhoids prolapsed place the patient upon the left side, with knees flexed on abdomen and two pillows between the knees. Cleanse the parts and see that all instruments and solutions are cold, before proceeding with the operation, as heat applied to a visceral area gives pain.

The hemorrhoidal areas are three in number, one on the left and two on the right side. The median raphe lies to the left of the median line, in this region, both above and below, establishing the left hemorrhoidal area in the centre on the left side.

First stage.—Select a point upon the skin, a half inch to the left of the anus, and apply the cotton tipped end of an applicator which has been dipped in phenol, to anesthetize the skin, and to mark the spot for the insertion of the needle. When the place has turned white insert into the loose subcutaneous tissue a fine hypodermic needle attached to a half ounce metal syringe loaded with an eighth of one per cent. quinine urea hydrochloride solution. Inject this solution very slowly. At the first indication of pain stop and wait till the pain ceases, then inject a little more solution, being sure to inject so slowly that you do not hurt the patient or blanch the parts. While distending the tissues and producing pressure anesthesia use the one needle puncture, which is indicated by the opening on the white carbolized area; by so doing you prevent the solution running out of a former opening while injecting at another. After thoroughly distending the parts from this one puncture you find that just the tissues you wish have become distended and at the same time the solution has not passed the median raphe but you have prolapsed the hemorrhoid and brought out the anorectal line. Now pass a sharp ligature carrier threaded with number two ten day chromic catgut, beginning at the junction of the hemorrhoid and the raphe below at the anorectal line, pass deeply, penetrating the deep fascia coming out at the junction of the raphe above and the hemorrhoid at the level of the anorectal line.

Second stage.—Remove the ligature carrier, leaving double ligatures. Place forceps on each end of these ligatures. Grasp the skin with a vulsellum and draw on the stretch. While thus making traction on

the skin, place another vulsellum at the level of the anorectal line, one blade at each exit of the ligatures. This vulsellum is placed for two reasons; first, in case the ligatures are accidentally cut during the removal of the hemorrhoid you will have landmarks for placing other ligatures, and, second, a branch of the inferior hemorrhoidal artery enters the parts through these tissues. After placing the two vulsellum forceps, try the ligatures to make sure that they have not been caught within the grasp of the forceps. If free, cut the skin up to the ligatures.

Third stage.—Grasp the hemorrhoid with sponge holders and make traction slowly and steadily outward and downward until normal mucosa is exposed. Now tie each ligature separately around the base of the tracted hemorrhoid. In making the first knot, do so very slowly so as not to hurt the patient, as the parts have not been anesthetized. After making the first tie, the others can be made more rapidly as the first knot produces pressure anesthesia.

Fourth stage.—Cut away the hemorrhoid just external to the ligatures. Remove the vulsellum. If there is spurting from the inferior hemorrhoidal artery clamp and ligate it. Leave the stump of the hemorrhoid free. This stump is anchored by the ligatures to the deep fascia and cannot retract, but remains within the grasp of the anal sphincters. There is just enough stretch on the skin to bring the two edges together; at the same time do not interfere with postoperative oozing, which is very essential, as any interference with oozing produces edema.

Repeat the procedure by passing through the four stages with each hemorrhoid on the right side, except when dealing with hemorrhoids of the first and second degrees, in which cases the two right hemorrhoidal areas should be removed at one time, taking away twice the amount of tissue on the right as you did on the left side. It is always advisable to operate on both sides in each and every case of hemorrhoids to avoid future trouble.

The operative advantages of quinine urea hydrochloride anesthesia are as follows: While following the operative technic it is necessary to proceed so slowly that you do not hurt the patient, and by so doing you ascertain definitely the exact amount of pressure you are using. The quinine urea hydrochloride being nontoxic, the operator is enabled to prolapse the hemorrhoids and bring out the well defined median raphe, at the same time leave the intervening mucosa to cover the surfaces. In being able to regulate the amount of pressure, which is necessary to prolapse the hemorrhoids, it is possible to limit the distention and anesthetization of the skin to that portion which should be removed.

The postoperative advantages of the use of quinine urea hydrochloride anesthesia are as follows: First, being nontoxic there is no reaction, as occurs after the use of certain toxic drugs. Second, it is not necessary to use drugs of the nature of epinephrine hydrochloride to block off absorption, so there is no interference with blood pressure. Third, this drug being a mechanical irritant to the tissues, it causes the production of a plastic fibrinous exudate, which is a decided advantage when operating on hemorrhoids, as it brings the elements of repair to the parts, and after the first sanguineous exudation, minimizes postoperative oozing. Fourth, this

plastic fibrinous exudate having been thrown out and absorbed, a barrier is produced which enables the operator to get his patient safely on his feet and back to his work during the period the process of repair is taking place. Fifth, there is produced what is to the patient, at least, the main advantage, namely, that the anesthesia being postoperative it lasts during the period the fibrinous exudate is being absorbed, which is generally a week to ten days.

In conclusion, I will say that a patient proceeds to recovery with practically no discomfort, provided the operative technic is handled in such a manner as not to hurt the patient, that we receive his co-operation, and that he goes about his business; by so doing our patient is relieved pleasantly. If, while following the operative technic, we attack and remove only those tissues necessary to give relief, and by the use of the mechanical irritation of quinine urea hydrochloride we bring the products of repair to the parts, the healing will proceed quickly. Not having interfered with the higher centres, and by the use of quinine urea hydrochloride we produce a natural barrier, we can say that we relieved our patient safely. This makes me believe that we come near fulfilling the golden rule of surgery by "relieving our patient, pleasantly, quickly and safely" in a class of cases, composed to a large extent of patients who would generally be considered beyond the age for safe surgical intervention. The average age for the development of first degree hemorrhoids is forty years, and the time necessary for the evolution from first degree to third degree hemorrhoids is generally ten years, which brings the average age for the beginning of the third degree hemorrhoidal period at fifty. As this unrelieved pathological condition persists during life, it necessitates our dealing with a class of patients the majority of whom are in the fifth to the eighth decade of life.

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GUNSHOT INJURIES OF THE CHEST IN CIVIL PRACTICE.

BY GEORGE P. MÜLLER, M. D.
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The treatment of gunshot injuries of the chest constituted one of the most interesting and important chapters in the medical history of the war and in the volume of literature was hardly exceeded by any subject except, of course, that of wounds *per se* and their treatment by revision, suture, and antiseptics. To the French we are indebted for much that is new, particularly to Duval for the development of the method of wide open thoracotomy and to Petit de la Villeon for his method of extraction of late projectiles. Those of us who were unable to participate in the active surgical work of the war must get our ideas from those who did the work, must assimilate the literature, and be prepared to adopt the plan of procedure in the hospitals with which we are connected, when a gunshot wound is brought under our observation. Let us first glance, superficially of course, over the record of accomplishment, and the plans of procedure, during the

forty years preceding the war. The oldest book on surgery which I own is that of Agnew who was professor of surgery in the University of Pennsylvania from 1871 to 1888. Writing in 1878 he devotes considerable space to chest wounds but his opinions are entirely colored by the work of Otis who wrote the chapters on thoracic surgery (1). His descriptions, however, of wounds, of hemothorax, and other matters, are minute and really worth reading at this day, but he suggests nothing that is radical. In speaking of hemothorax he advises enlargement of the wound, if by so doing the outlet for the blood to escape will be increased.

Agnew was succeeded by John Ashhurst and at the time I graduated, (1899) we were told by him to practice rest, apply cold and give opium. If bleeding from the lung continued he advised reopening the original wound to allow the blood to escape or the performance of paracentesis to relieve the dyspnea. Gross, professor of surgery in the Jefferson Medical College, writing in 1882, had a fair idea of the pathological consequences of chest wounds. He classifies them as: Primary—shock, collapse of the lung, hemorrhage and pneumothorax; and, secondary—inflammation and accumulation of serum, lymph, and pus in the pleural cavity. He states that in the Russian Army at the siege of Sebastopol the mortality from chest wounds was ninety-eight and five tenths per cent.; in the British Army it was eighty-one and five tenths per cent. He states that the Russian surgeons relied chiefly upon the use of digitalis; the British upon copious venesection. In the Civil War, of 1272 cases, seventy-three per cent. were fatal. Gross makes no mention of thoracotomy and he recounts a fatal case where the ball was loose in the pleural cavity and was followed by violent inflammation and death in four weeks. Such cases he says "must necessarily be fatal." Venesection and purgation were his sheet anchors, and the patient was always placed with the wound dependent to allow the blood to drain out.

In an address before the American Medical Association in 1903 Rodman stated that the treatment for gunshot wounds of the chest should, as a rule, be a "masterly inactivity; absolute rest, cooling drinks, a little opium, and a sterile immobilizing dressing constituting the only treatment necessary in the majority of cases. Pressure may be relieved by aspiration and hemorrhage controlled by strapping. Any attempt to recover the ball would be fraught with danger and is rarely justifiable, as the bullet will continue to be harmless unless it has carried in septic material."

But Koenig in the same year stated that the treatment of these cases depends upon individual circumstances. In general, he says, it may be stated that only rarely is one justified in operating within a short time after the accident for the purpose of arresting hemorrhage. If two or three days after the injury the phenomena (respiratory distress, frequency of pulse, and elevation of temperature) increase, one should not hesitate to perform a thoracotomy. A rise of temperature and difficult breathing appearing at a later stage suggest infection, and constitute another indication for operation. Notice

that Koenig refers to the elevation of temperature accompanying the hemothorax *per se*. This has often led to the mistaken diagnosis of infection and precipitated a thoracotomy plus drainage, thus almost inevitably producing infection. In order to avoid the possibility of infection in a hemothorax, operation should be performed only under the strictest aseptic precautions; otherwise a hemothorax may be converted into an empyema. When the resorption is slow, one may remove the blood by puncture, and only when this proves unavailing is a thoracotomy justifiable. This advice relative to the treatment of hemothorax is practically that of Elliot (1919) one of the best of the English authorities on the subject. Elliot says "early aspiration must be the routine and if this is found to fail by reason of clot, then the chest must be evacuated at the earliest possible date by thoracotomy, without drainage."

In the following year Grunert advocated a more radical plan of treatment, and advised delayed thoracotomy for the removal of the blood clot in slowly developing hemorrhage and immediate operation in severe cases with an attempt to arrest the hemorrhage by ligature, suture or tampon. In 1905 the epoch making paper of Garre appeared in which he presented a statistical study of 700 wounds of the lung treated conservatively, dwelt upon the high mortality under such methods of treatment, and exposed some of the fallacies which had long influenced the treatment of these lesions. He pointed out that the general mortality was forty per cent.; in ruptures of the lung, uncomplicated by other injury it exceeded fifty per cent.; while stab wounds and gunshot wounds in the antiseptic era exhibited a death rate of thirty-eight per cent., and thirty per cent. respectively. He also clearly demonstrated that antiseptics as ordinarily applied could not favorably influence the internal wound which opened the lung itself; that the small calibre jacketed bullet was as dangerous as the old fashioned projectile; he also asserted that the often repeated view that bleeding spontaneously ceased in the collapsed lung had neither clinical nor experimental confirmation. The prime indications for operation, according to Garre, were hemorrhage, (abundant, persisting, or recurring,) and pressure pneumothorax not yielding to aspiration. While these were only present in five or six per cent. of cases of lung injury, they demanded prompt interference. He collected nine cases of suture of the lung, including one case of ruptured lung (his own) with six recoveries. The principles of treatment, as he laid them down, are not very different from those found useful by his followers; nor has his technic been greatly modified except as influenced by the facilities afforded by the development of differential pressure and a better understanding of the influences of pneumothorax and its relationship to drainage.

This paper of Garre's, and the invention of the negative pressure chamber of Sauerbruch and the positive pressure helmet of Brauer gave an impetus to thoracic surgery which has continued to this day. A number of valuable contributions appeared in the German literature particularly those of Küttner, Lawrow, Stöckey, Möller, Wolf, and Grassman,

and the question was discussed in detail in the Paris Surgical Society in 1907 and 1909. In 1911 a lively discussion between the abstentionists and the interventionists took place at the International Surgical Congress. Lenormant drew up the report for this congress and, according to his statistics, out of 1056 cases the rate of mortality was only ten per cent. In order to appreciate these figures correctly, it must be mentioned that they deal only with patients in civil practice, and that cases complicated by injury of the vessels of the hilum were excluded. The rate of mortality would be considerably higher if all cases of injuries to the lungs were included. A third of the mortality in Lenormant's cases was the result of infection and two thirds from hemorrhage. He favored expectant treatment. At that time the abstentionists seemed to have the better of the argument because, while the reasoning of the interventionists was perfectly sound and their operative indications the result of logical deduction, the statistical evidence was not always as convincing. Thus Lavroff quotes the results of a series of 257 cases occurring in Zeidler's clinic during a period of five years. Of these, 155 cases operated upon gave a mortality of thirty-six and seven-tenths per cent., while in 102 cases treated conservatively the mortality was only fourteen and seven tenths per cent. The author explains the figures by stating that the nonoperative cases were far less severe in character.

Holmberg reported a series of 324 cases, of which 266 were stabwounds, thirty-nine gunshot wounds, and nineteen closed or subparietal injuries. All but four of these patients were treated conservatively, that is, the stab wounds were carefully disinfected and sutured; the gunshot wounds were cleaned and an aseptic dressing applied, and the closed injuries were treated expectantly. The total mortality in this series in injuries involving the lung or pleura was fifteen and eight tenths per cent., of which the largest series, that is, the stab wounds, showed eight and one tenth per cent., the gunshot injuries thirty-seven per cent., and the closed ruptures, forty-seven per cent. In spite, however, of the statistics of Lenormant, Holmberg and others, the tendency of the times was towards active interference, especially in those cases when hemorrhage and pneumothorax threatened life.

Thus, in an article by Brewer (2), written in 1907, he advised the following: Treatment of existing shock; control of cough and restlessness by morphine; disinfection of the wound area, rest, strapping of the chest; aspiration of air in pneumothorax. If there is a progressively increasing hemothorax threatening life, the surgeon should freely open the pleural sac by resection of one or more ribs and attempt to arrest the hemorrhage by suture, ligature, or by packing.

But, five years later Brewer wrote that he would advise immediate exploratory thoracotomy in all cases of penetrating wounds of the chest which presented signs of hemorrhage threatening the life of the individual or seriously embarrassing respiration; in all cases where there was reason to suspect injury of the diaphragm, heart, or other important structures; and in all cases of large pleural wounds

where there is evident septic contamination and an open pneumothorax. He advised careful disinfection and aseptic dressings in penetrating gunshot wounds without symptoms or signs of a more grave injury, and in simple stab wounds without evidence of grave hemorrhage, pneumothorax, or injury to diaphragm or heart. In all cases of doubt, in wounds of the heart zone, or in the region of possible diaphragmatic injury, he favored exploratory operation as the safest method of treatment.

In 1911 Jopson read an illuminating paper before the Philadelphia Academy of Surgery. He pointed out that the binding indications for operation in penetrating wounds were as follows:

1. A wound which from its situation and direction would render likely a penetration of the heart, pericardium, or diaphragm.

2. Severe primary or recurring hemorrhage, as shown by the physical signs of hemothorax or external bleeding, or by severe hemoptysis with threatened aspiration of blood into the other lung.

3. Secondary hemorrhage, especially to be looked for in gunshot wounds.

4. Severe pneumothorax, especially when accompanied by symptoms of mediastinal and cardiac displacement, dyspnea, cyanosis, and threatened suffocation, and which is not relieved by aspiration; also when extensive and increasing external emphysema is present.

5. Secondary pneumothorax, which is always due, according to V. Möller, to suppuration or sloughing of lung tissue.

6. Empyema.

At about the same time Dorrance, also of Philadelphia, reported the results of some experimental work on animals and advised the following: "If hemothorax develops the chest wall should be opened as soon as the diagnosis is made; all clots and serum removed; the wounds in the lung sutured; the pleural cavity inspected and its toilet completed; and the chest wall immediately closed, the lung being expanded by either negative or positive pressure. The suturing of the chest wall is effected by means of the layer method. With absolute asepsis and a faultless technic, especially in the matter of gentle handling, recovery without the formation of adhesions ought to take place in a large proportion of cases. The worst that can happen when this method is used is the formation of an empyema."

There is no essential difference between this procedure and the method of Duval now so widely known, from his writings, from the paper of Moynihan and the personal observations of those at the front.

This brings us to the period covered by the war, and while the experience in chest surgery during this time has been enormous in material and in the lessons learned, I will attempt no extensive review partly because of the limitations of space, but mostly because it is so fresh in our minds and so familiar to everyone who has read. Also it seems to me that many of the problems that engrossed the minds of Duval, Piery, Gregoire, Gask, Elliot, and others, were bound up with the military aspects, with transportation, the lack of equipment at the front, the sucking open wounds, the shell fragments

and so on, with which there is nothing comparable in civil life. The real problems seemed to be these, and not the management of the infected pneumothorax at the base hospitals, over which so much was made in the early years probably from the shortage of experienced surgeons. I would especially commend the books by Duval and by Gregoire, and the articles of Piery, LeFort, Gask, Lockwood, Elliot, Bradford, Nixon, and Moynihan. On our own side the list is already a long one, and is headed by the contributions of Yates and Graham.

The conclusions of Nixon were published in April, 1919, and therefore represent the latest opinion of those experienced in war chest surgery, especially as he was associated at various times with Duval, Gask, Anderson, Roberts, and Lockwood. The indications for immediate operation indicated by Nixon are: 1, Hemorrhage, 2, injuries of the diaphragm, 3, open pneumothorax (traumatopnea), 4, stove in chest, 5, retained missiles, bone, and clothing, and 6, early acute infection.

The patient may be unfit for operation owing to: 1, Intrathoracic injuries, 2, severity of the external or complicating wounds, 3, loss of blood, and 4, collapse or shock due to cold and transportation. Nixon then states that it is the physician's province to decide as to the nature of the intrathoracic injuries, and he must form a definite opinion on the following points:

Is there a sufficient degree of the following to account for the severity of the symptoms? 1, Pneumothorax, 2, hemothorax, 3, collapse of lung, 4, laceration or hematoma of lung, 5, injury of heart, pericardium, or great vessels, 6, injury of diaphragm, or 7, injury of vertebræ or spinal cord.

Radioscopy and radiography are almost indispensable in order to reach a correct conclusion on these points, but it will sometimes happen that a patient's condition will not permit of immediate x ray examination. When this is so, the question is rendered easier rather than harder. The patient is thus unfit for any immediate operation save one of the following:

1. Immediate and rapid operation for the arrest of visible hemorrhage from the chest wall or thorax.
2. Arrest of hemorrhage from coexisting wounds.
3. Aspiration for relief of pneumothorax (usually valve pneumothorax).
4. Aspiration for relief of hemothorax.
5. Temporary closure of open pneumothorax.

Apart from one of these procedures, there remains nothing else to be done than to resort to measures for resuscitation of the patient. Now, it is obvious that in civil practice many of these indications will not be met. The wide open pneumothorax and the stove in chest from shell wounds are practically never seen. I say practically because Waters (3) recorded a remarkable case of shotgun injury in a boy in whom a great hole was torn in the anterolateral aspect of the left side of the thorax. The great majority of the wounds encountered will be stab wounds, or gunshot injuries with or without retained missile, and sometimes with complicating injuries of the heart, mediastinum, diaphragm, or the abdominal organs, particularly the stomach, colon, spleen, or liver.

Duval states "that bullet wounds of the lung are either fatal at once by reason of injury to a large vessel, or comparatively benign; the wound is either aseptic or seldom followed by grave infection. To this single factor their slight severity is due."—Further, he states "from a surgical point of view bullet wounds are of little interest, as they do not demand operative interference." But bullet wounds and stab wounds will be the injury in civil practice, and they will be of interest to the civil surgeon.

The problem before us is—shall we operate in all cases of stab or gunshot wounds of the chest, or shall we wait for the complications of hemorrhage, pneumothorax, or infection to ensue? If it were not for the occurrence of infection we might formulate: Early operation is indicated, a, when there is a rapidly increasing pneumothorax (from a valvelike opening); b, when the rib has been splintered by the bullet, and the fragments press on the pleura, or have been driven inwards; c, when hemothorax is large and seems to be increasing. Late operation is indicated: a, at any time when the pleural cavity appears to be infected; b, after six or seven days, when the patient's condition is excellent and he has been well studied, to remove clot or missile.

The crux of the situation, however, hinges on the matter of infection. If we wait until the patient is in excellent shape to stand the operation we may lose the opportunity to so cleanse the pleural cavity that aseptic conditions can be established. If we operate in all patients immediately, we will lose many from shock, and the mortality of the total will rise.

Shock must be met first. The patient should not be handled roughly or rushed to the x ray room. The chest should be immobilized immediately on arrival, however slight the injury may appear to be. The patient should be placed in bed, kept warm, and the wound dressed, and quiet assured by the aid of morphine. He should remain in the ward, propped up in bed and only examined immediately if serious signs, such as those of persistent hemorrhage or asphyxiation pneumothorax suggest the necessity of an immediate operation. Elliot in his interesting paper published in 1919 states that the reflex reaction to the chest wound causes a strong muscular contraction of the walls of the bronchioles producing the early cyanosis and dyspnea. Rest and morphine soon allay this spasm in most cases. If prolonged reflex constriction of the bronchial musculature occurs with cyanosis, dyspnea, and inspiratory retraction, operation is not well borne.

The diagnosis of hemorrhage and pneumothorax depends on the usual well known signs with the variations so well described by Bradford and others, viz., the elevation of the diaphragm, the small size of the chest, the tendency to complete or partial collapse of the lung in any area, the compensatory emphysema above and other known physical signs. The important point for the surgeon to determine is whether the hemorrhage is continuing or is progressive. If from the location of the wound of entry injury of the abdominal viscera is suspected immediate operation should be done. In those cases where all goes well and the proper surroundings

and skill are available there seems no reason why we should not routinely open the thorax in from five to eight hours after the injury in cases even where there is moderate hemothorax or where there is a retained missile. I admit that the mere retention of a missile is a debatable indication for operation but the dangers of fibrosis, abscess, or bronchiectasis are too real to be disregarded. It has been noted by all of us that hemorrhage and infection are the causes of nearly all the fatalities and many of the fatal hemorrhage cases are probably beyond help by reason of large vessel injury and death before operation can be attempted. But I am certain that some patients die who could have been saved by prompt thoracotomy. Early operation should avoid most of the fatalities from infection.

Where there has been delay and infection of the clot supervenes, immediate thoracotomy, removal of the clot and institution of proper drainage should be the rule. Finally, the missile should be removed from the lung at the earliest practicable time, usually within two weeks, if primary thoracotomy has not been performed.

It is not necessary to review the technic of operation. The so-called method of Duval may be taken as the standard procedure. The methods practised by LeFort should be studied, particularly when we undertake the removal of a bullet from the mediastinum. I do not know whether Petit de la Villeon's method will become the universal practice; the recent papers by LeConte and Moynihan highly praise its efficacy, but it demands a special apparatus and a technic made perfect by practice and gunshot injuries of the chest are not so common in civil surgery. In stab wounds involving the diaphragm the consensus of opinion favors the thoracic route but I have successfully operated in such a case by the abdominal route. The physiological principles involved in opening the chest and producing a pneumothorax must be well understood, and the brilliant paper by Evarts Graham should be memorized.

The use of inhalation anesthesia and particularly ether or chloroform is a factor adding considerably to the risk. Duval advises local or regional anesthesia, stating that the patches of pulmonary congestion which so frequently occur after operation, may be in some measure attributed to the effects of inhalation anesthesia as well as to the after-effects of the wound of the lung.

Lockwood and Nixon also use local anesthesia reinforced by gas-oxygen while the hand is inside the chest or if the patient is restless. On the other hand, Gask prefers chloroform, either by itself or combined with oxygen. Yates found that a safe sequence in practice was found to be as follows: after the effect of the preoperative hypodermic of morphine was apparent, the administrations of pure oxygen under no tension were started. Then very gradually the pressure was increased, and the administration of nitrous oxide started. Rapidity of induction of the anesthesia was undesirable. Avoidance of excitation and the production of gradually increasing inflation were essential. During the operation the proportions of the gas-oxygen mixture and the pressure transmitted to the trachea were varied to meet varying conditions. After the pari-

etal pleura was closed the amount of nitrous oxide was gradually reduced; oxygen under pressure was continued until the patient was conscious.

The tendency of most writers has been to minimize the importance of pressure apparatus or endotracheal methods in traumatic chest surgery, but Meyers considers it wrong to draw sweeping conclusions from the experience gained in the war. I have recently operated on patients with gunshot and stab wounds and performed exploratory thoracotomies for malignant disease under ether anesthesia on open gauze but believe that the method of Yates just described is the best. This method gives all practical requirements for intrathoracic surgery without necessitating deep anesthesia for the introduction of intratracheal or endopharyngeal tubes. Moreover, its safety and ease of control has removed the chief obstacle to a wider application of surgical therapy.

One of the problems of chest surgery is the difficulty of suturing the pleura, so as to hermetically seal the opening. Duval sutures the intercostal muscles and pleura together; Moynihan in his well-known paper advises wide separation of the pleura from the ribs in all directions (thus mobilizing it) before opening the cavity. I have not found this to be a very satisfactory procedure; however, in several cases. The reason lies in the persistence of the rib separation at the conclusion of operation. A number of surgeons overcome this separation by passing silver or bronze sutures around the ribs above and below the incision and tying with sufficient tension. Duval mentions particularly the importance of covering the resected ends of the rib with a staunch muscle suture because of the difficulty in bringing the pleuræ together here.

Time does not permit further discussion. Bastianelli's use of artificial pneumothorax in the treatment of chest wounds is quite interesting. He believes that the air keeps the lung from contact with the pleural membrane until complete expansion has resulted, thus minimizing adhesions at abnormal positions. Duval on the other hand considers a pneumothorax as an injurious process and urges its removal. Yates brings out the interesting point that in his dog experiments in which the phrenic nerve was sectioned, the dogs showed a remarkable freedom from distress and a reduction in the amount of postoperative effusion. This method has been used for the treatment of tuberculous cavity but taken in conjunction with Bastianelli's observations would repay further study of lung wounds.

The surgery of the chest is now well on its way to further development and improvement, but the tyro must keep his hands off until he has studied the work of the masters of the past and has digested the lessons of the war. While Duval's famous dictum, "that the surgery of gunshot wounds of the lungs must be governed by the principles of surgery as applied to any other gunshot wounds," requires a number of exceptions, it is in the main true, and should lead us to the point where we can open the chest as safely as we now open the abdominal cavity.

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THE FUTILITY OF EXAMINING THE FILTRATE FOR THE PRESENCE OF OCCULT BLOOD IN THE GASTRIC CONTENTS.

By ANTHONY A. RUTZ, M. D.,
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Certain clinical and laboratory observations have recently impressed upon me the futility of examining the filtrate for the presence of occult blood in the gastric contents. Not infrequently it has been observed that gastric contents which on macroscopic examination contained blood when filtered become negative to occult blood tests. Furthermore, negative results from examination of the filtrate were too often at variance with the history and other findings.

In view of these facts it was determined whenever possible to make separate tests upon filtered and unfiltered gastric contents, and the results showed that in the majority of cases, in which the unfiltered contents were positive the filtrate was negative to occult blood tests. In a series of twenty-four cases in which the unfiltered contents were positive the filtrate was faintly positive in two and negative in the remaining twenty-two cases. In these twenty-two cases the unfiltered contents were strongly positive in thirteen, and faintly so in the remaining nine cases. Among the thirteen former were two cases of inoperable cancer of the stomach. In one of these the contents were light coffee ground in character and in four successive examinations the filtrate was negative.

The tests employed were at first both the guaiac and the tablet benzidin test of Dudley Roberts. As the results were similar, and as the latter is slightly more sensitive and far less time consuming, the benzidin test alone was employed in the later examinations of the gastric contents and in the subsequent experimental tests. The objections to the use of pure benzidin in the examination of the gastric contents for blood do not apply to the use of the prepared tablets, as these, though slightly more sensitive than the guaiac, are far less so than the pure benzidin. The test meals consisted of three Uneda biscuits and twelve ounces of water, the contents being removed one hour after ingestion.

It is evident from the foregoing that a distinct contrast exists between the filtered and the unfiltered gastric contents in their action toward occult blood tests. To determine the various factors responsible for this difference the writer conducted a series of studies:

1. Filtrates of solutions of blood (1 in 1000) in plain water or in sodium citrate solution were examined for blood. These were invariably as strongly positive as the solutions before filtration, showing that mere filtration without some change in the blood is not responsible for this difference.

2. Soda crackers were macerated in plain water and in gastric filtrates which were negative for blood. These gave negative tests showing that the presence of the crackers is not responsible for the positive reactions in the unfiltered contents. This is also evident from the fact that unfiltered specimens containing crackers are frequently negative.

3. That mucus itself is not responsible for this contrast is evident from the fact that often unfiltered contents, containing large quantities of mucus, are negative for blood. That the difference is not essentially due to the presence of blood in the mucus is shown by the following procedure: Stomach contents negative for blood were repeatedly filtered so as to remove the mucus. To these filtrates blood was added in the strength of 1 in 1000. They were then thoroughly mixed and incubated for one hour to represent more or less the physical and chemical changes which the gastric contents undergo in the body. At the end of one hour, these mixtures were examined for blood and were always found positive. These were then filtered. These filtrates were in the majority of cases negative and only at times faintly positive for blood, showing that filtrates of specimens containing blood become negative even in the absence of mucus. While the crackers and mucus are not the essential causes, they play a secondary rôle, as will subsequently be shown.

4. It has been proved that mere filtration without previous changes in the blood in the stomach contents cannot be the cause of the negative reaction in the filtrate. The blood undergoes definite changes in the stomach which are the cause of its total or partial disappearance in the filtrate. It is well known that in the presence of a weak acid, hemoglobin is decomposed into hematin and a globulin. The hematin is insoluble in weak acids, (occurring as amorphous granules, which by reason of their iron content have a high specific gravity and are strongly magnetic. That hydrochloric acid or, when this is absent, lactic acid is the essential cause of the contrast which exists between the filtered and unfiltered gastric contents, and that this is due to the fact that the granules of hematin formed by the action of the acid upon the hemoglobin are too large readily to find their way through ordinary filter paper, is evident from the following tests:

Three solutions are placed in separate beakers and are frequently mixed and incubated for an hour: a, 1 in 1000 solution of blood and water; b, 1 in 1000 solution of blood in two tenths of one per cent. hydrochloric acid; c, 1 in 1000 solution of blood in two tenths of one per cent. hydrochloric acid, with broken crackers added. After one hour, each mixture is tested for blood before and after filtration. In a, the filtrate and unfiltered solution are equally positive for blood. In b, the unfiltered solution is distinctly positive, while the filtrate is most often negative, but at times is faintly positive. In c, the unfiltered contents will be found positive, while the filtrate will be invariably negative.

As the only difference between a and b is the presence of hydrochloric acid, then the hydrochloric acid must be the cause of the absence of blood in the filtrate. It will be noted that the contrast between a and c is greater than that between a and b. It is evident that this must be due to the presence of crackers in c. The granules of hematin have a marked tendency to adhere to the larger particles of crackers in suspension, thus rendering filtration more complete. These tests were repeated with two tenths of one per cent. lactic acid solutions and the same results obtained as with hydrochloric acid. As

gastric contents are practically always acid, containing either hydrochloric or lactic acid, what has been shown applies more or less to all specimens.

5. That the hematin granules have a tendency to adhere to other particles in suspension is evident from the following observation: A weak solution of blood (1 in 5,000) is made in two tenths of one per cent. hydrochloric acid with broken crackers in suspension. The unfiltered mixture, after standing for an hour in an incubator, at the same time being thoroughly mixed, is tested for blood. It will be found that the liquid portion presents but little change in color, while the particles of cracker will be stained deep blue, showing that the hematin granules have become attached to them.

Frequently, when unfiltered contents are examined for occult blood, it will be found that the liquid portion is negative while the mucus is positive. While this, at times, is undoubtedly due to the fact that the mucus has been detached from an eroded or congested mucous membrane, yet I believe it is more often due to the granules of hematin throughout the contents having become adherent to the mucus. The mucus and food particles play the same rôle in the filtration of the gastric contents, as egg albumen in the preparation and filtration of broth cultures.

6. Specimens of gastric contents positive for blood were examined immediately after removal and the intensity of the reaction noted. These were then allowed to stand for three to six hours. At the end of this time the upper, clearer portion and the sediment were examined separately. It was found that the former was either negative or only faintly positive for blood, while the latter gave a stronger reaction than the freshly mixed contents. This is due to the fact that the blood exists in the form of hematin granules, which by reason of their high specific gravity and their tendency to adhere to other particles, rapidly gravitate to the bottom of the glass. This obviously is of considerable practical importance; for if the upper portion of such a specimen is poured off, and employed for the blood test, almost the same negative results will be obtained as with the filtrate.

Certain factors influence the contrast which exists between the filtrate and unfiltered contents. The sooner the filtration after removal and the greater the amount of blood in the unfiltered contents, the less the contrast. The greater the amount of particles in suspension, and the more thorough the process of filtration, the greater the contrast between the filtrate and unfiltered contents in their behavior to occult blood tests.

All these observations have been made sufficiently often to show that they are constant. They show clearly that examinations of the filtrate are unreliable in determining the presence of occult blood in the gastric contents. The mixed unfiltered contents or, if the test is to be more sensitive, the sediment after standing or centrifuging should be employed. This fact is not generally recognized; for in the leading textbooks on gastrointestinal diseases instructions are given to employ the filtrate for the test.

16 EIGHTH AVENUE.

FILING CONVENIENCES SUITABLE FOR PHYSICIANS.

BY J. MADISON TAYLOR, M. D.,
Philadelphia.

The man in active practice has need for convenient and systematic means for filing at least a dozen varieties of data of written or printed materials. Among them are the following: 1. Short notes on cases, on the casual client; to jot down the name, address, complaint and primary advice given. 2. Fuller notes on progressive cases. 3. Associated data, correspondence about cases, etc. 4. Business correspondence. 5. Reprints of medical and scientific papers. 6. Useful data from advertisers, objects, instruments, materials and drugs, especially working bulletins of new products and scientific researches of the manufacturing houses, as advocated by Dr. Francis E. Stewart. 7. Hospitals, sanatoria, special schools for mental defectives, convalescent homes, summer camps for boys and girls and others. 8. Climatic data, reports, transportation, miscellaneous. 9. Small card index for books; a, books in one's own library; b, books desirable to read at some time. Differentiate by colors of cards, or better by colors and separate drawers. It is also desirable that any or all of these reference data should be readily accessible, in reach of his office chair.

In pursuance of an earlier enterprise which impressed me with its importance, I wrote a series of letters to the editor of *Journal of the American Medical Association*, beginning about twenty-five years ago, offering suggestions to the great manufacturing houses, the purveyors of useful objects, drugs and other materials, urging that they adopt a uniformity in the size and shape of their printed matter, in particular that they use the standard three by five inch index filing card, for business summaries, cards or small booklets.

These recommendations were at once adopted by certain manufacturing houses and now most of the large drug firms are following suit. Later I urged that the leading medical journals agree upon a uniform size and shape of their fuller data. So far no attention has been given to the hint. They must come to it; the sooner the better. A recent communication elicited attention from some of the drug houses and I was asked to offer specific recommendations. After consulting the makers of filing cabinets I learn that it is entirely practicable to use certain standard cases. These being adjustable, any one being able to adopt some one or more parts, I offer the following idea.

A filing cabinet of standard qualities can be assembled to contain: 1, one section of five filing cases or drawers, each five by eight inches, horizontally placed; 2, one section, three drawers, nine and a half by ten and five eighths inches vertically placed; 3, one section of five drawers each three by five inches; 4, a stand sixteen inches in height. The whole constitutes a cabinet thirty by sixty inches of handsome appearance.

To this could be added one section of two drawers each eleven by fourteen inches. This would be admirably complete and would well repay

the cost, in time, effort, and worry now expended. The cost of this cabinet would be for the three sections (as first described) about ninety dollars at present prices. Should any one be interested I have sent a manuscript (accepted) to the *Scientific American* describing my own method of arranging and filing scientific data.

The serious difficulty which remains is to induce the medical journals to adopt a uniform size and shape for reprints. And yet in America we boast of our system; of our prompt adoption of all labor saving devices!

These suggestions would meet the current or urgent needs of most practitioners. Should anyone wish to go into the enterprise more completely or comprehensively, the methods of Melville Dewey, of the New York State Library at Albany, might be adopted, wholly or in part. It is called the Decimal Classification or Relative Index, and provides a practically perfect system for classification of data.

1504 PINE STREET.

THE DIAGNOSIS OF CHRONIC CONDITIONS BY THE SPINAL REFLEX SYSTEM.

By ALBERT C. GEYSER, M.D.,
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Correct diagnosis must forever remain the key-stone to proper treatment. Any means or agents capable of furnishing assistance are always welcomed by the physician and appreciated by the patient. Before we can form an opinion as to the use of electricity in determining the underlying cause of any chronic ailment, it will be necessary to review, at least lightly, some anatomical as well as physiological facts.

Entirely too much time is spent and too much stress is laid upon considering the pathology in any given case. Pathology is that branch of medical science which treats of the modifications of function and changes in structure caused by disease. It is always an aftermath. Let us suppose, for the purpose of illustration, that a tornado has passed through a part of the country. Usually an area of a certain width, and frequently miles in length, has been devastated, trees have been uprooted, houses blown from their foundations, fires may have broken out, and perhaps lives lost. After the storm (the disease) is over, those who were lucky enough to escape may view the ruins (the pathology). It may be granted that an expert in such matters may be able to tell us from the damage (pathology) done, just what kind of a storm it was; he may be able to tell us the extreme velocity of the wind as it passed through, as well as the direction from which it came; he may even know just how many such storms have previously occurred in this or some other region, or when another of a similar nature might be anticipated. While all of this is very scientific and interesting, the stricken population (the patient) are more interested in the reconstruction (the physiology) in the rebuilding and possibly in the prevention (prophylaxis) of a recurrence.

So far as the actual damage is concerned, it might

have been worse or it might have been better had it been caused by a conflagration, flood, or earthquake. This does not mean that pathology does not serve a good or useful purpose; but it does mean that, so far as a cure, a return to the normal, is concerned, more time should be spent in the study of physiology. This at least applies more especially to the practising physician. Pathology is always an end result, while physiology enlightens us in the actual reconstruction, in the appreciation of the deviation from the normal and a return to it.

Every chronic disease depends for its continuance upon a greater or lesser deviation from the normal anatomical and physiological makeup of the individual. It is, therefore, apparent that we must not only judge the individual as a whole, but must ever bear in mind the cellular construction of the human body. Each individual is but a conglomeration of cells; as each cell is, so is the individual; he is the cells, the cells are he.

THE CELL DOCTRINE.

Nearly a half century has passed since Virchow, in his *Cellular Pathology*, expressed the idea that each animal appeared as a sum of vital units, each of which exhibited all the characteristics belonging to life. Not only that, but he maintained the thought that each cell sprang from a preceding or parent cell by division, budding or otherwise; he believed that the character and unity of life were referable not to any single locality of a higher organization—for example, the brain of man—but rather to the definite, constantly recurring arrangement which each single element bears to itself.

Taking the correctness of this view for granted, the composition of a large body of the so-called individual must always depend upon a social arrangement; in fact, it represents a social organism in which there is a mass of single existences related to one another in such a way that every element has its own special activity, and each, when excited to activity by other parts, does its work and performs its function of and by itself. If this idea is correct it must apply not only to the body at large, but also to each organ, to the nervous system, even to each cell entering into the composition of any tissue.

During the last few years it has been possible to approach the nervous system with instruments of great precision, with better recorded observations of disease of the nervous system (testing and recording after condenser discharges on injured nerves), aided by the refutation or confirmation of previously existing data, thereby arriving at the newer conception of the neuron as a unit. In fact, the study of the functional units in the nervous system could be approached satisfactorily only after it had been clearly shown that the nervous system, like all other tissues, consisted of elements more or less isolated and independent, and connected directly with one another apparently only by contact, concrescence, or protoplasmic bridges, and after we had learned to recognize the different structures which belonged to the single elements.

THE NERVOUS SYSTEM, CENTRAL AND PERIPHERAL.

In describing the nervous system, for convenience of comprehension we separate the entire system

into two general divisions, yet it must ever be borne in mind that these two portions are anatomically, as well as physiologically, one system. The central nervous system includes the cerebrum, cerebellum, and the pons, or all of that portion enclosed within the cranium proper, while the peripheral portion in-

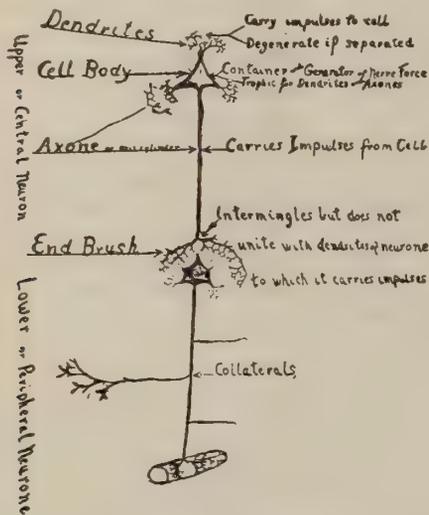


FIG. 1.—The ganglion cell with its dendrons and axis cylinder.

cludes the spinal cord, the nerves, and the sympathetic system. By virtue of its continuity, the nervous system brings into connection all the other systems of the body. Conforming, as it does, in shape to the framework of the body, its branches extend to all parts. These branches form the pathways over which the nerve impulses travel toward the central system, and, in consequence of the impulses received, there pass out from the central system other impulses to the muscles and glands. In order to maintain harmony between the activities of the several systems composing the body, it is at once apparent that the pathways leading to the central nervous system, as well as the paths conducting impulses from the centre to the periphery, must be in a normal state to perform their particular function.

A SHORT REVIEW OF THE ANATOMY OF A NEURON.

By the term neuron we understand the entire mass under the control of a given nucleus forming both the cell body and its branches. The cell body contains the usual granular material with a nucleus and a nucleolus. Nerve cells differ in the number of branches arising from them according to their physiological function. Motor cells possess one principal branch, which, when spoken of alone, is called the nerve fibre, but when considered as the outgrowth of the cell body from which it originated is called the axone. This axone usually has branches, which are designated as collaterals, and the distal ends of the axone divide into finer branches, forming the terminal arborization.

Contrasted with this principal outgrowth are the other branches of the cell, which are, of course, individually much shorter and which divide dichotomously at frequent intervals, forming a treelike appearance; hence their designation dendrites.

An axone in the central system may reach from the cerebral cortex to the lumbar enlargement, while the longest nerve fibre of the peripheral system reaches from the lumbar enlargement to the toe; the longest fibres are found in the spinal ganglia of the lumbar region, where one axone passes to the bulb while another of the same cell passes to the skin of the toes, thus spanning the entire length of the body.

Some of these fibres are medullated, while others are not; most of the nonmedullated fibres are found in the sympathetic system, although a few are present in the cerebrospinal system. The function of this medullary sheath is at best problematical; it has been suggested that this coat acts as an insulation, but there is hardly any warrant for such conclusion. That, however, it may act to the nerve fibre as the periosteum does to the bone appears more probable.

The ganglion cell with its dendrons and the axis cylinder with its terminal fibrils together form an anatomical and physiological unit—a neuron. (Fig. 1.). Every nervous pathway is made up of a series of such neurons communicating with one another. There does not seem to be any direct anatomical continuity in these neurons, which communicate with one another like cog wheels, the terminal fibrils of the axis cylinder of one neuron inserting themselves between the arborizations of the cells of another neuron. The brain, spinal cord, peripheral nerves, and sympathetic system are composed exclusively of neurons of this character and their articulations.

It is thought that the transmission of an impulse is effected from one neuron to another by some protoplasmic prolongation, or contraction and re-

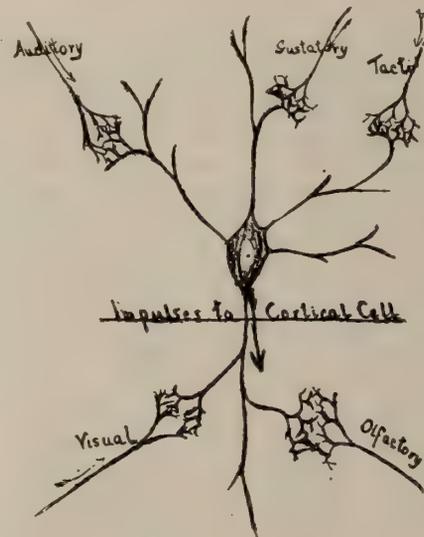


FIG. 2.—Communicating dendrons and collaterals.

laxation, or by some vibratory movements of the terminal filaments. Such impulses are carried to the cells by the axis cylinders. Every neuron probably acts in relation with several others, the most extensive communication being made possible by the innumerable dendrons and collaterals. (Fig. 2.)

A cortical cell may receive a single impression or a number of impressions at one and the same time. These impressions are weighed and may be transmitted to the motor cell of the central neuron. The central motor neuron transmits the desire to the multipolar cell in the gray matter of the anterior horn of the spinal cord. The peripheral motor neuron is then actuated and causes the propagation to the end organ; this may be a muscle, gland, or other tissue, which, when excited into activity, performs its physiological function. It is no fault of a normal tissue that it performs its own physiological function; it cannot do otherwise.

THE PYRAMIDAL TRACT.

Situated in the central convolution of the brain is the motor cortical zone. The cells located in this area form, first, the corona radiata, then, by converging, enter the internal capsule where they are found in the knee and the anterior third of the posterior limb. This portion of the ventral peduncular fibres emerges at the posterior border of the pons in a compact bundle, known as the pyramid, and

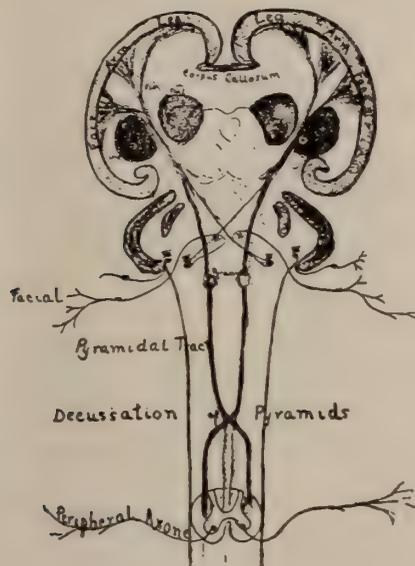


FIG. 3.—The pyramidal tract.

continues its way down the spinal cord as the pyramidal tract. (Fig. 3.)

Most of the fibres undergo decussation and occupy the lateral column, while the smaller, uncrossed portion remains in the anterior column. This tract contains the longest fibres of the corona radiata and can be followed in the lateral column of either side as far down as the conus medullaris. This tract forms the central motor pathway. The axis cylinder, or nerve fibre, of this central tract splits up along various levels of the brain and spinal cord into its terminal fibrils, which surround the dendrons of the ganglion cells of the peripheral motor neuron, located in the various ganglionic enlargements of the spinal cord. The nerve processes of the peripheral cells emerge as nerve roots from the brain and anterior horn of the spinal cord of the same side, and are continued as motor fibres to the muscle, where they finally break up into their ter-

minial fibrils among the individual muscle fibres (end organs). The central motor neuron, therefore, undergoes decussation, while the peripheral does not.

The impulses which originate in the cells of the cortex are transmitted to the muscle through the pathway formed by these two neurons, and from the decussation of the central neurons it follows that the cortex of each hemisphere controls the muscles of the opposite side of the body. In apoplexy the lesion occurs upon one side of the cerebral hemisphere, while the muscular paralysis, owing to the decussation of the central motor fibres, presents itself upon the opposite side of the body. On the other hand, in poliomyelitis, the multipolar cell in the anterior horn of the spinal cord is involved. It is at this point that the central neuron ends, while the peripheral begins. Since the peripheral motor neuron does not decussate, it follows that the muscle paralysis must occur upon the same side as the lesion in the spinal cord. In cerebral apoplexy the blood clot presses upon some portion of the motor cortical zone or upon some of the axis cylinders in the capsule, hence the will or the desire for muscular contraction cannot be transmitted to the multipolar cells in the cord. This lack of impulse transmission causes the paralysis. Since the affected muscles are in anatomical and physiological contact with their trophic centre there is not only no wasting nor atrophy, but there may be a spastic paralysis in addition, instead of a flaccid paralysis. In poliomyelitis the axis cylinder, the end plates, and the muscles are separated from their trophic centre; hence there is complete flaccid paralysis, as well as early atrophy. The atrophy in cerebral hemorrhage is gradual, the result of nonuse; the atrophy in poliomyelitis is due to the loss of the nerve or centre of nutritional control—secondarily to the nonuse.

Every neuron cell exercises a trophic influence on its processes, including the long axis cylinder process, the end organs, and the tissues which it supplies. If this influence is destroyed, the corresponding nerve fibre undergoes degeneration, and the ganglion cell itself suffers degenerative changes if the continuity of the neuron is for a long time interrupted.

THE SENSORY PATHWAY.

The function of the sensory pathway is to conduct sensory impressions from the periphery to the centre. The peripheral sensory neuron complex of the extremities and trunk is contained in the sensory fibres of the peripheral nerves. From its various distributions to the skin and other parts, it continues its course to the spine through the fibres of the various plexuses, and ends in the cells of the spinal ganglia, without directly entering the spinal cord. (Fig. 4.)

The cells in the spinal ganglia differ from other cells in that they possess two axones, giving the appearance of the fibre entering at one end of the cell and leaving at the other; these fibres, by which the nerve leaves the cell in the spinal ganglia, collectively form the posterior root, and, as such, the sensory peripheral neuron finally reaches the spinal marrow, the posterior roots entering in two separate parts

into the posterior columns that lie between the posterior horns. After its entrance into the spinal cord, each root fibre divides into an ascending and a descending branch, and these branches soon divide to communicate with the cells in the gray matter of the spinal cord, as well as sending collateral branches

fore the cortex of the cerebrum is put into communication with the periphery.

THE REFLEXES.

By a reflex action, we mean a motor act performed automatically in response to a sensory impression. The entire act is confined to the peripheral neurons, which, therefore, form the reflex arc (Fig. 6). This reflex arc is composed of a sensory portion contributed by the peripheral sensory neuron, a motor portion contributed by the motor peripheral neuron, and a connecting link formed by a branch of the sensory neuron after its entrance into the spinal cord; the last is known as the reflex collateral. The course of the cutaneous and tendon reflex arc is better known than that of any of the others. We distinguish a short and a long reflex arc. The short reflex arc consists of a collateral which passes directly from the posterior column through the posterior horn to the cell in the anterior horn; under this head are included the plantar and spinal reflexes. The long reflex arc is formed by the reflex collateral splitting up about a cell in the anterior horn; from this cell an ascend-



FIG. 4.—The sensory pathway.

upward into the posterior columns, where are located fibres controlling tactile sense and muscular coordination. These fibres pass upward through the entire length of the spinal cord, and finally break up surrounding cells in the nucleus of Burdach and Goll, located in the medulla oblongata. The terminal divisions of the peripheral sensory neurons take place about the nerve cells lying in the following regions (Fig. 5): First, in Goll's and Burdach's nuclei in the medulla; second, in the various portions of the posterior horns; third, in the middle zone between the anterior and the posterior horns; fourth, in the columns of Clark; fifth, in the anterior horn.

The central sensory neuron complex begins at the ending of the peripheral neuron in the regions mentioned in the first four above noted distributions. These fibres, which enter the posterior root zone and communicate with cells situated in the anterior horns (noted fifth above) are especially concerned

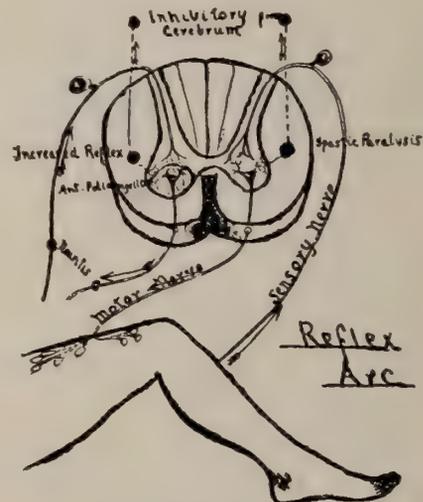


FIG. 6.—The reflex arc.

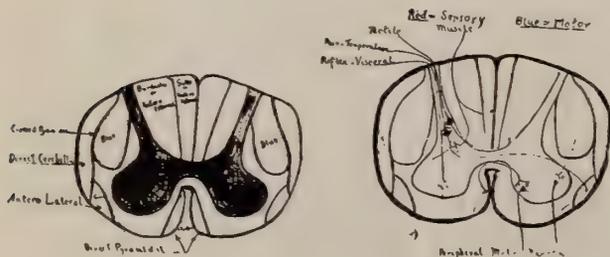


FIG. 5.—The terminal divisions of the peripheral sensory neurons.

in reflex action. Up to this point the distribution is fairly well settled, but the further course of the central sensory tract is still a matter of dispute. By some authorities it is maintained that, after the central sensory neurons reach the medulla oblongata, one, two, and even more neurons, are required be-

ing and a descending branch, with several collaterals, pass to one or more motor ganglion cells, which may be situated at various levels of the anterior horn. This gives the possibility of reflex movements being transmitted to more remote muscle groups.

Of the more complicated reflex arcs we have little definite knowledge, as the pharyngeal, nasal, bronchial, conjunctival, pupillary, and others. There are, however, a few of the more important reflexes that should not go unnoticed. Locomotor ataxia, for instance, even in the beginning, may be diagnosed by the absence of the patellar reflex, the absence of the pupillary reflex, and the swaying of the body with the eyes closed; here, then, we have three reflex arcs, any one of which should cause a further investigation, while the presence of any two of these would strongly point to an assured diagnosis of tabes dorsalis.

In order to elicit the presence or absence of the knee jerk, the patient should be placed in a sitting posture, on a high stool, so that both legs are free

and not resting upon anything; the patient should then be instructed to link his hands together, close his eyes, and to exert a strong pulling force with both hands the moment that he feels the blow struck upon his patellar tendon; this, of course, simply assists in diverting the patient's attention from himself, and all undue strain or tension is thereby removed from his lower extremities; it is also well to bear in mind that, with some normal individuals, the knee jerk is absent. This absence of the knee jerk was first described by Westphal, hence its name, the Westphal sign.

The Argyll-Robertson pupil is a loss to accommodation to light, but not to distance. It may be obtained best in a dark room by suddenly flashing a small electric light, when a contraction of the pupil should occur; the absence of this contraction furnishes a valuable reflex diagnostic sign.

The Romberg symptom is usually present early in locomotor ataxia and is due to loss of muscular coordination. Place the patient in a standing position with his heels and toes together, body erect, order him to close his eyes, and very shortly a marked swaying of his body will be observed. This swaying may become so intense that the patient must be guarded lest he fall. The Achilles reflex in some cases of locomotor ataxia, as well as in paresis, is sometimes absent even earlier than either of the previous ones.

In lesions of the peripheral nervous system we have, then, generally speaking, a loss of reflex action, while in disease of central origin we expect to be assisted by an undue increase of these reflex phenomena.

INCREASED REFLEXES

The patellar reflex may be markedly increased; the increased reflex act, however, is best shown by the ankle clonus, especially if clonus is present. Take the heel of the patient in the palm of the hand and with the other hand make sudden pressure upon the ball of the patient's foot so as to cause a strong flexion of the foot; as long as this flexion is maintained the ankle clonus, if present, will be manifested. Such an increased action, then, would indicate a lesion of central origin, with possible secondary changes in the pyramidal tract, as in lateral multiple sclerosis, or as the result of apoplexy.

The cutaneous, or superficial, reflexes are not so well understood; attention should, however, be directed to the Babinski phenomenon. Under normal conditions, if the sole of the foot be irritated, excepting in very young infants, there is a flexion of all the toes, but in diseases of the pyramidal tract or apoplexy, when the sole of the foot is gently irritated, there is a gradual extension of the big toe, sometimes of all the toes; this becomes, therefore, a valuable reflex sign in cases of coma, for if present it will be pathognomonic of cerebral apoplexy.

SPINAL REFLEX DIAGNOSIS.

Last, but by no means least, is a condition of the sympathetic system along the entire length of the spinal column. During the past ten years I have examined over a thousand spines for this sign, for I know of no other means or symptoms capable of furnishing such unerring evidence of disease as the

spinal sympathetic system. No matter how recently an injury has taken place, no matter how long ago or how obscure the symptom of a chronic ailment may be, as long as some portion or organ of the economy suffers, a reflex centre corresponding to that portion or organ will surely be found somewhere in the spinal cord. Some of these spinal centres are well known; others are more or less obscure. The sense of sympathetic painful areas, however, comes to our aid, though in eliciting pain we are obliged to rely upon the statements of a patient who may be nervous and whose sense of pain may be perverted and, therefore, misleading. Fortunately, I am able to call your attention to a system that will at once commend itself to you for its simplicity as well as for its accuracy.

A correct diagnosis usually narrows the treatment down to a very few agents, and it is merely a matter of expedience which particular method of therapeutics we employ in any given case. Admitting for the sake of argument that it was difficult, nay, even impossible, to arrive at a correct diagnosis during the acute stage of the disease; what, then, are our chances during the chronic stage? Again, we must bear in mind that the patient during the chronic stage is no longer suffering from the acute disease; but rather from some changes that have taken place in the economy, as the result of the acute condition. In other words, the symptoms have entirely changed. Hence we speak of symptomatic treatment, meaning thereby the amelioration of the various symptoms as they may be complained of by the patient. If we give this so-called symptomatic treatment a passing notice, we must admit the absurdity of it and our inability to do better. Here we have a patient whose whole system has been more or less changed by the processes of disease and repair, whose manifestations and interpretations are anything but normal. Let us take, for instance, the neurasthenic, the hysteric, and the hypochondriac. If we were to administer treatment according to the interpretations of their feelings, our already overcrowded therapeutic armamentarium would certainly be inadequate and our results even more chaotic than they are now. In refutation it might be said that these three conditions are not truly disease conditions, but rather psychic conditions; let us bear in mind that the man or woman who thinks he or she is sick, and is not, is sick indeed.

I venture to say there is not a single symptom or manifestation of disease without some underlying cause. The first step in therapeutics is to remove the cause, for no matter how often or how much we may treat the symptoms, unless the underlying cause is removed, the same symptoms must again appear, though changed through the administration of our symptomatic treatment. It is the cause of the symptoms, and not the symptoms themselves, that require our attention. To make it more clear, let us suppose a patient complaining of nothing more than a headache, which may be due to toxemia from intestinal origin, derangement of the gastric functions, changes in the circulatory system, changes in the kidneys, defects of the visual apparatus, frontal sinus disease, nasal or middle ear lesions, uterine lesions, intra-

cranial tumors, congestion or anemia of the brain or its coverings, syphilitic changes, constipation, and a host of psychological impressions. Certainly, with even a slight thought upon the subject, we must become convinced that a cause must be discovered and removed before any real benefit can be expected from our therapeutic applications.

As has been stated, in chronic diseases we are more often suffering from some obscure cause and the symptom complex is frequently referable to some undiscovered lesion bringing forth rather reflex manifestations than directly associated conditions. Pain is an expression of some interference with a sensory nerve, central or peripheral. Without the intervention of a nerve of sensation there could be no sensory impression. Paralysis, or motor inability, necessitates the interference with the function of a motor nerve, either the nerve itself centrally or peripherally, or joint and muscle changes preventing the motor nerve from carrying out its physiological function.

Changes in tissues or organs in general are presided over, not by the sensory or the motor nerves, but by that third system of nerves, the sympathetic. All growth and repair of tissue is under the direct control of the sympathetic system. All injuries, traumatic, chemical, or biological, aside from the pain, loss or increase of motion, are under the direct influence of the sympathetic nervous system. It is this system that takes cognizance of the changes which have taken place and, under its control through the vasoconstrictors and dilators, the process of repair is more or less perfectly carried out.

THE AUTONOMIC OR SYMPATHETIC SYSTEM.

For our purpose and for the sake of brevity we will make no special distinction between the sympathetic proper, the bulbar, and the sacral subdivisions. Neither is it advisable to consider in too much detail the anatomy of this system, but only so much of it as is really necessary for the elucidation of the problem of spinal reflex diagnosis. The sympathetic nervous system is intimately connected with the cerebrospinal system, though it differs from it in many ways, especially in its peripheral distribution.

The sympathetic system consists of a highly complex arrangement of ganglia, nerve fibres and nerve plexuses, which are distributed to the different regions of the body. Especially does this peripheral distribution hold good for the blood vessels. Wherever blood flows, there is found a sympathetic nerve to control the same. The largest blood vessel, as well as the smallest capillary tube, has its own sympathetic fibre. In its minute structure the sympathetic system presents the same general constituent elements as the rest of the nervous system, viz., nerve fibres, ganglion cells, and a complicated fibrillary network around the ganglion cells which probably originates in the processes of the nerve fibres. The single nerve fibres unite into nerve trunks, while the ganglion cells and the network of fibrils accumulate at certain points along their course.

THE SYMPATHETIC AND VASOMOTOR SYSTEM.

Beginning with the Gasserian and otic ganglia within the cranium we have placed upon the ante-

rior and lateral aspects of the spinal column a chain of similar glands. In the cervical region we find three ganglia, the superior, the middle, and the inferior cervical, while below this region there is placed one ganglion corresponding to each of the vertebræ. These two chains of ganglia are connected so as to unite in the lowest ganglion, the ganglion impar. From each one of these ganglia fibres are given off to pass into the cerebrospinal column through the nervi rami communicants. Other fibres are given off at various levels of the spinal cord to follow the course of the blood vessels, and in this way the sympathetic nervous system is brought into close contact with every single part of the body. In fact, each individual cell is under the direct influence and control of this system.

If, then, a single cell within the body were to receive even the slightest injury, it would become the duty of this system at once to recognize such injury and, by sending some sort of stimulus to the corresponding ganglion of the cord, start the process of repair either by limiting, or, as is more likely to be the case, to increase the local blood supply to this part.

Each organ within the body has located somewhere along the spinal column one or more of these sympathetic ganglia which neither rest nor sleep, but continually, like faithful sentinels, attend to the least beck and call of the particular region or organ with which they are connected. Let us suppose for a moment that something has gone wrong with the stomach; then the ganglia located at the third, fourth, fifth, sixth, and seventh dorsal vertebræ would at once be made aware of such an injury and within these ganglia all would be excitement; much as though some fire station should receive a hurry call or to hold itself in readiness to give assistance at the next tap of the bell. Let us carry our imaginary excitement a little further by assuming that the call bell has struck, again and again, yet with all the available force working, the apparatus can not be moved an inch; the call bell keeps on ringing; the men, frantic at their work, now gradually cease and drop from sheer exhaustion; no help has been sent and the destruction by fire goes on. So in our sympathetic ganglia; if the injury is great enough or repeated sufficiently often, these ganglia, after a valiant effort, are obliged to refuse, in order to save themselves from utter destruction. Such stations along the spine are known as sympathetic spinal centres. Many of these centres are well known, as the centre for respiration, the centre for cardiac activity, the centre for the liver, large and small intestines, the centre for parturition, micturition and defecation.

During the last few years, laboratory and clinical data have enabled us to locate more or less definitely nearly all the various centres along the spine. In the first part of this paper we saw that this sympathetic nervous system sent its branches wherever blood flows; it so happens that a branch of these ganglia controls the blood supply to the skin immediately overlying the region of the particular ganglion in question. That is to say, if we are dealing with a lesion of the stomach, for instance, the pyloric end of the stomach, then the area over the

fourth and fifth dorsal vertebræ would be supplied by a branch of the sympathetic from the ganglion, because the ganglion located here controls the pyloric end of the stomach. Would it seem very far-fetched if, in carcinoma of the pyloric end, or any other chronic lesion at this region, we should also find some small involvement of the region surrounding the centre along the spine? We know that this does happen. I can do no better than refer to any one of the modern textbooks on diagnosis, where complete charts will be found giving locations of painful areas along the spine associated with various internal disorders.

In its distribution along the spine, the entire sympathetic system may be divided into three main divisions, viz., the cervical brain, extending from the atlas to the fifth cervical vertebra; the abdominal brain, extending from the first dorsal to the second lumbar; the pelvic brain, extending from the ninth dorsal to the fifth lumbar. While these divisions are only arbitrary, they nevertheless serve as a guide to the distribution of the main plexi and the particular area they control. In order to appreciate more thoroughly the diagnosis of chronic ailments, it will be necessary to keep in mind the fact that we may, and usually do, have symptoms in some organ, yet that organ is perfectly healthy and so requires no therapeutics; it is simply a reflex symptom. A gravid uterus may cause uncontrollable emesis; the gastric organ is not at fault, yet the vomiting is the only symptom of which the patient complains. Intestinal parasites may cause convulsions, yet no physical signs of the worms may be present; in fact, nothing seems to point to the intestines at all as the possible site of the trouble. Ocular defects have been known to be the only cause for epilepsy, yet have never been suspected. Lumbago, a frequent condition during stone in the kidney or bladder; yet there may be nothing wrong with the lumbar region itself. Headache, due to some gastric disturbance, hemorrhoids and constipation furnish reflex symptoms too varied and too numerous to mention. This array serves once more to impress the necessity of locating and treating the cause and not the apparent symptoms.

HOW TO LOCATE THE CAUSE.

We thoroughly appreciate the fact that every organ in the body is controlled by the sympathetic nervous system, and that this system has located near the spinal vertebræ certain ganglia; that these ganglia act as substations or centres from which impulses are sent out. We also appreciate the fact that the overlying skin area surrounding these centres shares in the immediate condition of the centres themselves. If, then, any one organ in the body is abnormal, the corresponding centre must also be abnormal. Now it is simpler to find the abnormal spinal centre *per se* than to find the abnormal organ *per se*. Knowing the centre we can easily locate the organ supplied by that centre and so find the underlying cause for the particular ailment.

APPARATUS NECESSARY.

Procure a high tension faradic coil with not less than five thousand feet in the secondary winding; personally, I never use less than seven thousand feet,

and lately I had built for me a coil with eight thousand feet of especially fine wire, and two interrupters in the primary. Why do I use such a length of fine wire, and why two, instead of the usual one interrupter, in the primary? The greater the number of secondary turns surrounding the primary of a faradic coil, the oftener are the lines of force cut and, therefore, the greater the tension, or the penetrative power, of the secondary current. The fine wire is used instead of the coarse so as to make the distance between the centre of the coil and the periphery, or the last layer of winding, as short as possible. The more rapidly the current is interrupted the less the sensation to the sensory nerves, and so this kind of current may be used to its fullest extent without practically any sensation or muscular contraction to the patient. For these reasons the error should not be made of using a short coil, for it cannot produce the desired penetrative power nor the necessary interruptions, but instead it may cause severe muscular contractions of a decidedly painful quality.

A muscle will respond to individual stimuli up to about thirty a second. As muscular contractions and relaxations require time for their performance, when the rate of interruption is higher than thirty a second, there is not enough time for complete relaxation and the muscle assumes a condition of tetanus. This tetanic condition becomes more and more manifest as the oscillations increase in frequency, until they reach about three thousand a second, and is stationary or at its maximum up to five thousand a second. If the rate of vibrations is still further increased, the muscle gradually returns to a flaccid condition because it can no longer respond; it no longer appreciates the stimulus; consequently, there is no muscular reaction.

TECHNIC.

The patient is placed in the horizontal posture upon the examination chair or couch; the spine is uppermost and bared. A large felt electrode, not less than six by eight inches square, properly moistened, is placed just above the umbilicus so as to cover the abdominal brain or solar plexus. This pad is attached to the positive end of the coil, while the negative end is attached to an ordinary sponge hand electrode, not over two inches square. This examining electrode should be fitted with an interrupting device.

The current is now turned on from the full length of the winding to about one half of its possible strength and the sponge brought in contact with the cervical region of the patient. The interrupting device is released and the current flows. The patient is now consulted as to the feeling of the current, which must be in no wise disagreeable. If everything is working satisfactorily, the electrode is gently moved up and down the entire length of the spine six to eight times, with moderate pressure only. The patient should now tell the examiner if the current is felt more in one spot than in another. If it is not felt anywhere in particular or everywhere alike, increase the current and proceed as before. If the patient shows by wincing that there are some tender spots, mark these spots with an indelible pencil.

The current may now be stopped and, to our surprise, just where the patient complained of feeling the current, there appeared bright red areas from the size of a twenty-five cent piece to the size of the palm of the hand.

These spots stand out in bold relief upon an otherwise white background. This phenomenon must have a cause and we must account for its occurrence. Immediately underneath this red area are located spinal centres which, perhaps, have been for a long time laboring under great stress from the impulses sent there from some abnormal organ. Now, when this hypersensitive area is irritated with the proper kind of current, it will respond by an increase in the local blood supply long before the rest of the skin along the spine is even aware of the presence of the irritant. By looking at our chart we find which particular part of the body or which organ is associated with the responsive centre, and so locate the abnormal or diseased organ which is responsible for the hypersensitiveness of the sympathetic area just tested.

Once having located the organ or region it is not very difficult by a process of exclusion to arrive at the correct diagnosis.

ANEMIC AREAS.

Besides the red spots just mentioned, every once in a while it happens that a certain sharply circumscribed area will suddenly become blanched. Such areas are of the same general contour as the red spots. There is no doubt that, in my earlier tests, many of these anemic spots escaped my observation, yet when once seen, thereafter, when one is on the lookout for them, they appear almost as plain as the hyperemic areas. At this writing I am not able to give a very satisfactory explanation as to their true significance.

Since the red spots apparently reflect a condition of hyperexcitability in the ganglion from some irritation from a distant organ, is it not also possible that these anemic spots portray the true condition when the opposite state exists? Let us suppose that an organ like the kidney is in an anemic state, the small fibrous contracted kidney; then, if the ganglion has long since given up the attempt to produce any change or repair, the ganglion itself would be in a more or less anemic state; it would then reflect its own condition through the blood supply in the overlying skin area, hence the anemic or blanched spots. It is, however, purely speculative on my part at this time to venture these suggestions.

Just a word about such diseases as hysteria and neurasthenia. It seems as though two such diseases ought to be differentiated easily, but as a matter of fact they are not, especially when the main symptoms of either are more or less present or absent in the same individual. How will a spinal diagnosis help us, then? Simple enough, if one stops to think before proceeding with the mechanical part of the work. Neurasthenia is, as the name implies, an asthenic condition of the nervous system due to debility or weakness of the nerve-centres, not in any one particular spot, but a general exhaustion. When the sympathetic nervous system has for a long time taken notice of such a condition, it is ready to respond to almost any kind of stimulation or irri-

tation, and thus, in neurasthenia, the entire length of the spine will present one long red streak. In this instance the neurasthenic patient and his spine are in absolute harmony. Such patients respond to every new kind of a therapeutic procedure for a time; they are the ones who constantly supply the sinews of war to the ever new, and more or less fantastic, therapeutic measures brought to their attention.

If the examination is made with extreme caution we will frequently be able to locate the underlying causes by watching the manner or order in which the various portions of the spine turn red. In every case of neurasthenia there is an underlying cause; it is not always easy to detect it, but it is there.

In hysteria we have the opposite condition; a more or less perverted state of the mind due in most instances to some slight underlying physical cause. When a spinal examination is made, hardly a single spot or reaction is seen, even after prolonged irritation, because the psychical element predominates over the physical. Neither does such a patient complain of the strength of the current; in fact, as a rule, the stronger the current the better he seems to like it. But even here, if a reaction does appear it is very insignificant, out of all proportion to the gravity of the symptoms as complained of by the patient. Nevertheless, we again are frequently led to the source of this disease.

I do not wish to convey the impression that this method of diagnosing disease is in any way a substitute for other methods; on the contrary, in locating the organ at fault all the other methods must be brought to bear, until, by a process of elimination, the final and true pathological status becomes known. Perfect and valuable as this system of reflex diagnosis may be, it merely locates the seat of the trouble, leaving us to find out the rest; it does not tell us what the trouble is.

301 WEST NINETY-FIRST STREET.

HEREDITY.

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THE NEURAL CONTROL.

It has been indicated how the fixed principles of natural law necessitate the perpetuation of a cell type indefinitely, irrespective of the effects of environment or natural selection: how the proliferation of a cell into a mass (or zone) carries within the zone evidences of a limiting power analogous to that giving form and shape to a crystal: how groups of heterogeneous proliferating cells held together by chemical affinity, will upon proliferation form bodies, and how the necessity of coordination and function between the zones of a body, require the establishment of a mechanism of balance and what was termed a neural control.

The combination of elements forming a cell whose functions are limited to intake, output, and proliferation, would obviously require little control other than that furnished by the chemical valencies of its elements. When, however, a group of heterogeneous

cells, each bearing the potential of a zone, proliferates to form a body, then the complexity of a body is in direct ratio with its number of zones. Its neural control will be correspondingly complex, approaching infinity in the number of its possible variations. The addition of special senses, mechanisms to accommodate environment, and its motility—one and all add their quota to the bewildering labyrinth of neural activities as impalpable, intangible and undefinable as electricity, yet obviously as quantitatively and qualitatively dependent upon chemical reactions.

THE INSTINCT OF POSSESSION.

The zone is the unit of structure. It as a unit develops, matures and reproduces its kind. It may mature earlier or later, may be weaker or stronger, yet as one of a communal group it is dependent upon the action of the neural control. A zone therefore has no method of escaping the responsibilities of its position. Its desires must be transmitted to the neural control, compliance with which would mean the activation of all the mechanisms of the body. Thus a deficit of chemical elements transmitted by a zone would produce hunger in the neural control. To appease it the huge complex of the body mechanism must be set in motion. To satisfy the zone the muscles of volition move the legs, the arms, the jaws. The mechanism of digestion prepares to disintegrate the food into the elements suitable for all its zones, and the distributing channels dispose of it impartially—to the zone complaining—but also to the others. If the environment is unfavorable and the food difficult to secure, the action becomes more complex. The special senses are called upon. They register impressions which are referred to memory cells. If memory fails to recall experience, a process of reasoning must ensue, and the experiment of edibility tried, controlled in a measure by the chemical repulsions indicated by odor and taste. If an object known to be edible is in possession of another, offensive measures may be tried, or, if this fails, methods of deception used.

In either case, the origin of a habit can be observed, forming within the neural control of considering the desirability of objects—a sense of ownership regarding them. It should be clear that an environment whose aspect was harsh and forbidding would more readily produce such an effect than one offering a profusion of edible substances.

It is of importance that the relation between the chemical wants of the zones and the resulting effect upon the neural control be clearly understood, as, though applicable to all forms of life, it will be especially significant when the gestational phenomena of woman is considered. The sense of ownership is the natural corollary of the struggle to live, following as it does the ordinary process of growth entailing the constant supply of elements. It is, therefore, a primal impulse or instinct, and for want of a better designation it can be termed "The instinct of possession."

When the quantitative nature of this instinct is shown to follow the influence of environment, its great potential in the economic life of man and con-

sequent bearing on the subject of heredity will be apparent. It is undeniable that the constant use of offensive mechanisms to obtain food might develop a ferocity of great and unreasoning power, might even produce an unbalance in the neural control changing an appetite omnivorous in nature, into one purely carnivorous, but the ferocity which resented the presence of another, to say nothing of questioning its claims, would produce nothing more than a consciousness of self—an ego—with but rudimentary impulses of possession.

If, however, an ovum is fecundated and its zones proliferate within the uterus of a woman, it is obvious that its growth will depend upon the mechanisms of her body. Moreover, every zone in her body being a chemical analogue or replica of those in process of proliferation within her uterus, will have added to its normal demands for food the requirements of the fetus. The result will be that every energy of her neural control is constantly directed in its dual capacity of sustaining two or more groups of zones. To this responsibility for the proliferating zones is added the necessity of securing protection for them. Thus the female becomes peculiarly susceptible to environment and anything remotely suggesting protection received through her special senses will exert enormous influence.

The driving impulses of hunger transmitted from her zones and of the body of the fetus will, after the delivery of her progeny, culminate in the development of the great primal instinct of possession, modified by the attending protective impulse, producing that most wonderful of emotions—the mother love. In the transmission of this instinct, the factors of its production are active, carrying its potential from generation to generation through the zonal nuclei. Thus habits will be formed, as each body, depending as the case may be upon one or more of its special senses, will perpetuate the custom of selecting certain foods, raising its progeny or adopting a mode of life, thereby increasing the scope of judgment of the neural control.

It will be observed that the possessive instinct differs in its manifestation. In the female it is protective and self-sacrificing, while in the male it is essentially selfish. This selfishness produces end results of remarkable significance. Thus a perfectly coordinating body, having by its ruthless power secured the food or necessities of others in a group, becomes a menace, driving them to the use of cunning. Complex judgments have to be formed resulting in group action to enforce the right of the individual. Here then would be established a precedent, the glimmering of the recognition of the law of ownership as applied to the entire group.

Custom will establish the precedent by which the group profited, which in turn will react upon the neural control of the strongest in an effort to establish his precedence. In all the complex, the neural control is activated and driven by the same impulse unmodified, brutal and ruthless. It is the personification of the law of survival whether exemplified by strength or cunning, in the group or in the individual—the possessive instinct of the male.

THE INSTINCT OF SEX.

When a zone matures it extrudes nucleii, which are carried to the ovary or testicle, there to await the action of the body. One zone may mature before another. In this event the zone may seek to readjust the relative importance of its position in its communal group and as a consequence cause an unbalance in the neural control. Thus vague and unformed sexual manifestations often appear before puberty, due to the maturity of one or more zones, the degree being in direct ratio to the number of zones maturing and the unbalance differing as the control is more or less influenced by their chemical activation. When the body matures (all the zones) the tremendous power exerted by the combined forces demanding the extrusion of their nucleii, may even counterbalance the influence of the instinct of possession, depriving the neural control of its power to reason and producing as a consequence varying degrees of incoordination.

However, the result of one zone maturing or the whole group is always conducive to unbalance of a greater or less degree, but fortunately, as in the adjustment of the special senses to coordination, the regularity of zonal impulses produced habits, so in the adjustment of sexual elements, the habit of functioning at regular intervals is caused by quantitative changes. The extrusion of nucleii by a zone depending as it does upon the zone's virility, and the latter in turn depending upon the amount of food furnished, would inhibit excessive proliferation under normal conditions.

(As an interpellation and with apologies it is thought advisable to mention the possible rôle played by the zonal nucleii in the production of malignant growths. The fact that Cohnheim made a suggestion connecting embryonic elements was the result of the observation of their behavior. The fact that such growths are influenced by the same destructive agency inimical to ovi and spermatozoon as to cancer, is striking, especially so when it is recalled that no known agency capable of destroying the fecundated ovum in utero without injuring the mother, exists. It can be expelled but not destroyed—except by radium.)

Resuming the consideration of the impulses essential to the perpetuation of life forms, we find that in the manner detailed is thus thrust upon the body, the second great quantitative instinct as a factor in the phenomena of the life of a mature body—the instinct of sex.

Like the instinct of possession it is quantitative, varying in direct ratio with the activity of zonal reproduction. It is unlike, however, in the period of its activity. The instinct of possession persists in varying degrees throughout the life of the body, while the instinct of sex, as the zones one by one cease to proliferate, become ineffective and nugatory. Thus a period of greater or lesser length may transpire between the end of sexual activity and the dissolution of the body, in which the neural control ceases to be influenced by the impulse of sex. Here, then, is a period of varying length of time wherein the neural control retaining memory, capable of observing and registering impressions, is not under the driving zonal impulse. The calls

for food are perfunctory, the zones are quiescent, the neural control is left to dream on its memory pictures.

We have, then, two governing factors, the one resulting from the chemical needs of the body structure, the other from the requirements of the law of proliferation, the one arising from deficit and the other from a surplus. And yet a third appears, a factor which intrudes itself with intangible persistence and unknown potential. It is the neural control itself with the suggestive power of its dreams formed when bereft of its impulses, an ego without responsibility, capable of forming thought.

SPECIAL SENSES.

Reference has been made to the special senses acting as aids to the neural control and the mechanisms of the body. The recognition of but five may be due to our exceedingly limited powers of observation, or to the fact that the present environment of man has not called into use the full potential of his structure. We know of curious phenomena regarding thought transference in what has been termed telepathy, of strange gifts regarding the multiplication of numbers, of complex vague phenomena relating to unknown conditions and suggesting the bewildering possibility of projecting without the body, an unknown entity, but whether this, if possible, would be a special sense, an aid to the control, or the neural control itself is a question. Fantastic as the notion may be, it must be met with an open mind. It is probable that as the neural control accommodates itself to new environment it seeks to make use of a potential of which nothing is known, and that such phenomena are nothing more than manifestations of a special sense, as yet undeveloped because of lack of use.

The donated elements forming the neural control are received from the zones, leaving them connecting filaments to transmit their desires. Individually, the zones have no use for special senses other than the tactile, and in this the economy of Nature may limit an allotment, or distribute it over many zones through the medium of their covering. If the connecting filament is broken, the zone is cut off from its neural control. It wastes away, not being able to transmit its wants, and it is doubtful that it proliferates, as a starving body ceases to proliferate, becoming sterile if the degree of starvation is extreme. If the connecting filaments have been incompletely severed, the attention of the control can be called to the trouble and the body mechanisms of repair activated.

The ability of a zone to transmit its desires gives it protection, as it then comes under the supervision of the control. This may explain the so-called faith or miraculous cures wherein the concentration of the neural control has been centred upon one or more zones, with the result that the complaining zones secure relief, if within the power of the body mechanism to give it.

Thus tactile sensibility might be considered the essential of the group of special senses. To what degree of acuteness it might be trained would be difficult to determine, but that it has a profound connection with the neural control should be obvi-

ous. It serves the body in many capacities and it would reasonably hold a place of great importance.

The hand as the principal factor using the tactile sense would therefore be worth observing. When the palm of an infant is touched, it closes its fingers. When the palm of an infant ape is touched it does not grip except perfunctorily. The grip of an imbecile corresponds to that of the ape. The idiot does not close its fingers. Beginning then with the idiot we can ascend the scale of mental development and it would seem to correspond to the reflex of the sensory nerves of the hand. When therefore the palmar reflex of an infant at birth is weak and ineffectual, the existence of an unbalance in its neural control can be suspected, in the same manner that the reflex of Babinski is elicited in certain lesions of the brain.

Every zone in the body has an interest in the ability of the hand to function, its potential therefore should be correspondingly great, and that superstition and ignorance may have deduced great numbers of foolish inferences, should not rob us of the real significance of its indices. The infinite variation of the whorls and deltas observed in finger prints must have their significance, as well as the shape, motility and ability to coordinate.

Thus a perfect hand would suggest a normal zonal alignment if coupled with normal sensibility and power of coordination; the inference could be drawn that no unbalance existed in the control. If variation from normal was found, and the hand could be identified as ancestral, the unbalance, if any, might be traced. However, the tactile sensibilities are rarely acute. Many errors of judgment follow their transmission to the neural control, yet the errors made are relatively few when compared to the number following the transmission of visual impressions. The complexity of the latter mechanism involves so many adjustments that this is to be expected, nevertheless, such judgments (faulty or accurate) as are made, are more lasting than those attributable to other special senses. They may be modified by the discovery of the error, but the unreliability of visual transmissions will have impressed the neural control. A state of indecision is produced. Judgment is held in abeyance, and the inability or refusal to decide forms a habit, thereby increasing the amenability to suggestion.

Thus a mass of individuals may be swayed by suggestion and accept the preformed judgment suggested. It is the dominating factor of the group, and may influence habits in the matter of food and gestation to such a degree that an unbalance may ensue. However, the same factors working for unbalance could be directed to constructive and beneficial ends, as the receptive potential is the same. Plasticity of group consciousness is an essential to the coordination of the group.

That interpretations of visual impressions may be used as suggestions, and are transmitted as received through the auditory apparatus, would indicate that the auditory, like the sensory, is reliable in its transmissions. Its faults are more prone to be those of omission than distortion. It must not be inferred from this that the auditory transmissions have little influence except as they

may be used for the purpose of suggestion. The fact that the position of the tympanum may alter its functional ability to transmit, indicates that as in the visual mechanism, the necessity of perfect coordination is required before maximum results are obtained. Thus the tilting of a lens may cause an astigmatism, or the inclination of the tympanum to a greater or less degree from the vertical, may interfere with the perfect transmission of sound. The result of perfect coordination is observed in the one by the production of marvelous artistic creations, in the other by equally wonderful combinations of sound meeting in harmony. The olfactory in man, like the sense of taste is hardly worth consideration, as its capacity for either transmission or reception is perfunctory.

THE CONTROL.

Emerging from this jumble of complexities surrounding the neural control, we enter the domain of the control itself. So far the reactions of transmitted impulses have been considered, its dependence upon various mechanisms of special sense, and its duty to secure coordination, have been roughly outlined. The possibility and degree of variation, due to the inefficient service of its aids has been mentioned, also its amenability to suggestion. There yet remains the neural control when deprived of its special senses and its driving impulses. Difficult indeed is the conception of this thing as an entity, unless we accept the vague fancies of the ancients and call it a soul.

However, assuming the structure of the body to be zonal in nature, the neural control would of necessity have to be formed from elements donated by each zone, thereby supplying the essentials of coordination and function. A study of the neural control, would however, eliminate all the factors with which it is surrounded, even the zones from which it derived its elements. We would then have a group of elements whose potential would be in direct ratio with their number and ability to function. In this case the consideration of an individual element might lead to an estimate of the potential of the group. Here there intrudes the elusive, intangible factor, attributable to the innate inability of the mind to reason except from simple analogies. To speak of energy, either electronic or atomic, or the principles of chemical attraction or gravitation, would lead to nothing. We accept these principles as axiomatic in their application without understanding. It is useless, therefore, to attempt an analysis of what we term nerve energy, yet we can accept as a fact that such energy depends upon the presence of neural elements. Moreover, the quantitative nature of its energy must follow variation in the quantitative amount of elements. In the matter of qualitative factors we can only surmise. Every neural element may be protean in its potential, or contrarily may differ in functionable adaptability. The fact that special senses are formed, suggest special adaptability, though no reason exists for assuming such an hypothesis to be correct. The optic nerve, if supplied with the mechanism of conduction, may be as well able to transmit auditory impressions, as the aural, or vice versa. The inability of the afferent nerves to transmit efferent impulses

may be only apparent, or it may be that nerves of special sense are formed from elements differing in potential from those of the neural control. However, the phenomena of life, as we observe its manifestations would indicate that neural elements had special adaptability. In either case the phenomena that is of interest is presented by a group of elements capable of forming judgments, and even if a reasonable solution of this problem were available, there would yet remain an unknown potential.

The bewildering possibilities suggested by the appearance of strange and unknown forms of energy such as are manifested in telepathy, mind reading, and thought transference excites the imagination. The existence of an astral body and its possible projection follows as a natural inference. However, if the neural control is a complex, it must receive the factors of its complexity from its elements, in a similar manner to that in which it receives the quantitative factors of its elements from its zones.

The quantitative factors together with the qualitative make up the neural control and while an estimate could possibly be made as to the former, it would be impossible to even approximate the latter, formed, as it is assumed to be, by donations of elements from the body zones, the quantitative factor would resolve itself into a question of the absence or presence of the donations. This would have significance wherein relative variations in size could be observed.

We know that teratomata are produced having headless bodies, and from this fact, could infer that zones can and do proliferate without donating neural elements, but the presence of a head of its size or shape could not be used as a positive index of the quantitative aspect of the neural control. It must not be assumed that the contents of the cranium constitute the neural control. Far from it. The control does not proliferate. It is doubtful that it has growth, as growth would entail the need of supply and waste. Therefore from birth to dissolution it remains as first formed by the grouping of its elements. Exceedingly minute as this entity must be, it should be obvious that its position as control requires a huge complex as an aid, and it is this complex that fills the skull.

It is, of course, probable that a body having donated the required elements to form a perfect neural control, might fail to furnish the normal amount of material to equip the mechanisms of special sense. We would then have a small skull enclosing a very acute intelligence, capable, no doubt, of making up its deficiencies in special aids.

If, however, the control has been formed with a deficiency of elemental donations, it would be improbable that such a control would require the same number of aids as a normal group. If present they would only add to its inability, and if absent would present an index of the deficit in the size of the head.

Therefore a small head attached to a body incapable of coordination, or having obvious mental deficiencies of greater or less degree, would be the index of an imperfect neural control, one which lacked in zonal donations, and which as a conse-

quence, would be unable to function normally, even if equipped with perfect mechanisms of special sense.

As space forbids a lengthy consideration of the subject, it can only be remarked in closing, that the neural control seems to represent a plastic entity whose susceptibility to suggestion is its most astonishing attribute. Its impulses (instincts), its special senses, its environment—one and all sway it from one extreme to another. It gives the impression of seeking an outlet by accepting anything offered, then finding the means or the information to be unavailable or untruthful, it turns to something new. Most of its abnormalities are the result of accepted suggestions leading it to the brink of destruction, hence it doubts everything that is new, or apparently new, yet blunders time after time because of its limited experience.

620 WEST 190TH STREET.

INTESTINAL SYMPTOMS IN MALARIA.

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Intestinal morbid phenomena are to be counted among the reactions of malaria, and to these I desire to call attention. Some arise during a malarial paroxysm and have only an ephemeral existence; others are quite independent of any attack and represent individualized stubborn accidents of some duration. To the chronic intestinal accidents of paludism I shall not refer. No matter how frequent or serious they may be, their origin is quite variable and is due either to intestinal or hepatic lesions. The clinical picture is more likely to be that of dyspeptic states rather than true enteritis, although a number of observers, impressed by their diarrheal or mucorrhœic character, are inclined to classify them among the enteritides.

On the other hand, the acute infections are easier to study and present a considerable clinical interest. Their origin is more univocal and their nature quite similar. The acute, temporary and occasionally almost cyclical character makes of them a class by themselves; their early occurrence in malaria defines them distinctly from chronic lesions or from functional or glandular disturbances of long standing which might disfigure their clinical aspect. Finally, their fleeting character facilitates a comparison eminently useful from the physiological viewpoint between the reactions of the paroxysms and those entirely different arising in the premonitory or intercalary state. On the other hand, as they are simply the stepping stone to chronic accidents, they foretell the progressive development by throwing light on the true causes, and permit of a better understanding of the biological processes which govern them.

The intestinal accidents of acute paludism consist essentially of watery diarrheal intestinal discharges. They are for the intestine what bilious vomiting is to the stomach during a paroxysm. They are accompanied by epigastric pain and hepatic tenderness. The liver is increased in size. The intestinal reaction consists of frequently repeated intestinal discharges of a

serous, bilious or mucorrhœic liquid, which causes a burning sensation in the anus. They sometimes last as long as the attack of malaria, but generally subside on the second or third day. They cease with the sudoral crisis.

Abrami and Foix divide these intestinal accidents into two categories, namely diarrhœic and dysenteric, and maintain that the former are more fleeting, while the latter are more stubborn, but in reality, the first indicate an almost physiological excitation of the liver, the latter a true lesion of the intestine, whose progressive development may end in chronic colitis and cachexia. In some cases the diarrhœa appears as much as two hours before the onset of the malarial paroxysm, in others only a half hour or fifteen minutes before, announcing the imminence of the attack. Out of a total of seven cases observed by Loeper, of Paris, three times the diarrhœa disappeared with the chill, three times it continued up to the sudoral phase, and in one only did it continue until the following day. One of these patients later on presented an atypical form even after treatment with quinine and arsenic, exclusively characterized by attacks of diarrhœa with hardly any elevation of the temperature, and accompanied by enlargement of the liver.

These intestinal accidents may, consequently, be very early in their occurrence and, in a way, are a sort of prelude to the paroxysm of malaria. Out of a total of eighty-two patients, Loeper found it thus in nine per cent. and always with the same character. The diarrhœa is never painful, there is no intense colic reaction and palpation of the abdomen is painless. Alone, the enlargement of the liver is constant, contemporary with the diarrhœa and occurring quite as early in the process, indicating the relationship between the hepatic and intestinal reactions. Loeper never found any glairs or blood in the intestinal discharge, and only occasionally a slight mucorrhœa. The stools were invariably very liquid, somewhat frothy, brown, yellow or green in color, but always becoming green when exposed to the air. Therefore, these are bilious stools, similar to polycholic stools accompanying certain hepatic morbid processes or such as occur during certain thermal cures, for example Châtel-Guyon, Grande-Grille or Vihel. For that matter, it is not uncommon to observe a mild icterus and a bilious tint of the urine on the next day. Besides, the blood often contains a rather high content of urea which may reach forty to fifty centigrams to the litre of serum. The serum is distinctly yellower than normal, while the cholemia is higher than ordinary cholemia, and these data suffice to prove, as the clinical examination predicted, the part played by the liver in the various morbid manifestations.

Desirous of more precisely establishing the hepatic origin of certain forms of malarial diarrhœa, Loeper carried out a more complete and close examination of the stools and hepatic functions. The examination first of all dealt with the chemical composition of the stools, their tenor in bile and pigment. After this attention was given to the liver in relation to its functions. Research for biliary pigment in the stools was positive, Schmidt's technic with a three per cent. to five per cent. mercurous

chloride solution caused the characteristic green hue. Cholesterin was also detected and occasionally even the biliary salts. Carbohydrate and muscular débris were noted and merely indicate a rapid transit through the intestine. There was no albumin undoubtedly because no blood or serosity of inflammatory origin was present in the stools. On the other hand, search for amyolytic ferments, according to the technic of Ambard, Binet and Stödel, often placed a large proportion of amyolysis in evidence, a fact which would tend to prove that the pancreas, like the liver, is the seat of an abnormal functional excitation and of an exaggerated secretion.

Exploration of the liver may be carried out by several methods, the one most frequently employed being alimentary glycosuria and the study of the nitrogen coefficient. In respect to the disturbances so far considered and whose principal character is their extreme suddenness and fleeting nature, it is evident that the test of alimentary glycosuria can only be utilized with difficulty. The same may be said of alimentary glycemia, which Beaudoin has tried to substitute for glycosuria in many cases. On the contrary, the nitrogen coefficient can be quickly established by an examination of the urine at the onset of the attack and during the phase of full development. It unquestionably gives interesting results, since it permits one to note from the pre-monitory phase a very high content—from ninety-three to ninety-six centigrams, and in the later phase, especially the terminal, the rather low readings of eighty and seventy-six, which in the first instance show an excitation of the organ, in the latter an inhibition. Another still more certain proof of this hepatic excitation can be found by the study of adrenalinic glycemia. It is a well known fact that an increase of sugar in the blood is a result of an injection of adrenalin. This increase, according to Loeper's researches, is constant and invariably about equal in a healthy individual, submitted to a similar diet. As an echo, there is glycosuria, but glycosuria is less constant than glycemia. The rise of the glycemia is due to exaggeration of the amyolytic power of the liver and as both Verpy and Loeper have surmised, many data can be obtained from its pathological variations relating to this very important function of the gland. Loeper employs the following technic:

The patient should be fasting and in identical former alimentary condition (one litre of milk, mashed potatoes and macaroni). An injection of one milligram of adrenalin is given in the thigh and both before and after the injection a sample of blood is taken and by Bertrand's invariable procedure, the sugar is estimated in the state of glucose. In normal conditions the glycemia increases very quickly and the ascending curve returns to the normal after the lapse of about three hours. The most constant figure is that of the first hour and it is for this reason that Loeper has taken the sample of blood at the end of the hour. In a normal subject the increase of the glycemia attains from forty to fifty centigrams with a most curious regularity. In affections of the liver it is quite variable, much lower than forty centigrams in some, much over forty in

others, even reaching one gram in some cases. Low increases occur in atrophic cirrhosis, in serious morbid processes of the liver and in exhausted hepatic glands and hepatic insufficiency. The high rates occur in livers stimulated by the violent initial reactions of acute diseases and the more durable ones of hypertrophic and hyperplastic hepatitis.

In acute malarial paroxysms these same phenomena of excitation and of deficit are most manifest. At the onset of the attack, at the very time that the diarrhea takes place and the liver prepares its defensive action, the reaction increases and may attain from seventy-five centigrams to one gram eight centigrams. At the height of the attack it constantly diminishes and hardly ever exceeds seven to ten centigrams. Then the sugar content progressively returns to normal. A rather curious thing is that the preceding glycemia is usually more intense at the onset of the attack and less during the phase of full development, but the adrenalin reaction is not greatly disturbed by these initial variations. These variations are often, but not always, absolutely proportional with those of the nitrogen coefficient or that of the alimentary glycemia, because they are related to the different functional processes; in some the ureogenic, in others amyloplexic, in still others amylolytic.

It is curious to observe with what rapidity, the attack having ended, the hepatic reactions return to their previous state. These change later on as successive attacks occur, following the same plan and order, then they lose their importance, their regularity and distinctiveness. This is because in the advanced phase of paludism the test is no longer made on new soil but on one that has been overturned. The hepatic gland gradually becomes accustomed to these multiple irritations and becomes immune to them. The charts are no longer those of frank paludism. The progressive changes of the liver succeed these successive assaults so that the various tests do not give their former distinct results.

The liver is unquestionably, of all the abdominal viscera, the one which gives rise to the most interesting reactions during the evolution of chronic malaria, namely, hypertrophic and nodular hepatitis, resulting from repeated functional excitations, each one of which adds its quota and leaves its imprint on the glandular parenchyma. Or there may be an atrophic hepatitis, the hepatic activity becomes extinct and the secretions progressively dry up. Therefore, to these two orders of lesions correspond two very different functional states which are distinctly revealed by a chemical analysis of the blood and urine. In the first are met the high nitrogen coefficients, marked glyceamic reactions and high percentages of urea; in the second, a lowering of the nitrogen content, a diminution of the glycemia and blood amylolysis, and the adrenalin test increases the glycemia to eighty centigrams to one gram in the first, while in the second it is hardly twenty-five to thirty centigrams.

From these functional hepatic disturbances a series of general and abdominal symptoms result, one of the most frequent being diarrhea. The diarrhea of chronic malaria becomes progressively installed, it then becomes permanent and leads to caehexia. Al-

though its origin may be a superadded dysentery, awakened and kept up by the malaria, or even a true malarial inflammatory mucorrhoeic enteritis, in the stools of which some observers have found red blood cells containing the plasmodium, it is quite as often due to some morbid change in the liver. It is no longer an enteritic diarrhea but a dyspeptic one, in which an excess of bile or hepatic insufficiency are to be held responsible, and should the enteritic process develop later, it has none the less been set up by the dyspeptic state. Thus the variations in the hepatic functions during an acute paroxysm of malaria, in their almost cyclical and rapid succession, sum up the changes of these same functions in the evolution of the malarial liver. They are, to a certain extent, the imprint that the malarial process makes on the entire existence of the patient. In what has been said I have endeavored to make clear the understanding of the intestinal accidents of paludism in general, and this now brings up the subject of hepatic dyspepsia.

Some of these intestinal reactions might well be given the name of premonitory diarrheas. Exact from the clinical viewpoint, in the sense that the diarrhea announces the near advent of a paroxysm, the term premonitory is inexact from the standpoint of physiology, because the diarrhoeic reaction is not, in the strict sense, a humoral reaction. It is, in some cases, the indicative reaction, while other symptoms, such as lassitude, chilliness and discomfort, pass by unnoticed. It marks the entrance upon the scene of the parasite that an examination of the blood from the liver, spleen or even of the general circulation will reveal. This has been done by obtaining blood simultaneously from the liver by puncture and from the pulp of the finger. In two cases the plasmodium was the falciparum type, in the third case it was the vivax. On the slides the crescent shaped extraglobular bodies were seen adherent on the red cells, young schizonts with their annular shape and fine nutritive vesicle and even some rose shaped ones. Staining showed these details distinctly. They were the parasites of the tertian, usually simple, rarely those of pernicious paroxysms. Unquestionably, the fact that they were found does not necessarily imply that the diarrhea would not have occurred without them.

This early appearance of the diarrhea testifies to an invasion of the liver by the parasite and likewise indicates the exciting action of the latter on the hepatic gland and the effort of the liver to rid itself of them by the bile. It is quite natural that it may precede the initial chill since, on its way, it is the liver that the parasite encounters before becoming scattered in the general circulation.

It is difficult to say why in some patients the hepatic reaction is more prone to occur than in others and there is no evidence that there is an abnormal susceptibility of the organ. It appears probable that, although not yet verified, the intimate mechanism of the excitation is the outcome of a direct action or the secretion of toxic substances, perhaps even the production of new proteic bodies, as has been advanced by Abrami who has attempted to explain the production of the paroxysms by this theory.

LONDON LETTER.

*(From our own Correspondent.)**First Annual Report of the Ministry of Health—St. Andrew's Institute for Clinical Research—Report of the Interdepartmental Committee on Insurance Records—The Municipal Hospital at Bradford.*

LONDON, September 17, 1920.

Two reports notable from the viewpoint of public health and preventive medicine have recently been issued, the most important of which is the first annual report of the Ministry of Health. This document begins by discussing the work done by the Ministry in fighting tuberculosis. The main conclusions of a report of an Interdepartmental committee appointed in 1919 to investigate the matter were that the existing accommodation in sanatoria and hospitals for the treatment of tuberculosis in the United Kingdom was, as a result of the financial and other restrictions of building during the war, most seriously inadequate in quantity; and that in the development of schemes for the institutional treatment of tuberculosis it was necessary not merely to increase the available sanatorium and hospital accommodation but in addition to secure the provision of facilities for the occupational and vocational training of sanatorium patients and also for their permanent settlement, after training, in village communities where they could earn a livelihood under sheltered conditions. The sanatorium patient would thus pass through three stages, first of treatment in the sanatorium, second of training under medical supervision in the training colony, and third of permanent employment or occupation in the village settlement. The training colony, though it might be physically separate from the sanatorium, should always form part or be a direct extension of the sanatorium. The committee also expressed the view that the tentative standard of one sanatorium bed and one hospital bed for each 5,000 of the population, which was suggested in 1912 by the Departmental Committee on Tuberculosis, had now proved to be insufficient.

It was also recommended by the Interdepartmental Committee, with regard to sanatoria for soldiers, that the national scheme for the treatment of tuberculosis should be supplemented by a scheme for training and employment in training colleges and village settlements, which would in the first instance be available for tuberculous ex-service men. The Treasury has approved the scheme and the funds will be supplied. It is pointed out that the selection of suitable occupations in which tuberculous men should be trained while under treatment at sanatoria has been receiving consideration for some time past. The difficulties which will arise in the absorption of these men into industries are considerable, and probably the only method by which many of the men will be able, after training, to earn a livelihood for any prolonged period without frequent relapse and ultimate permanent breakdown is by being placed in such special conditions and surroundings as will afford them shelter from the full stress of competitive industry by enabling them to live in a village settlement or an industrial colony established on lines specially designed for these purposes. It is essential to remember in this

connection that the working capacity of the tuberculous person in whom the disease has developed to any appreciable extent is seriously impaired, perhaps permanently. The Ministry is accordingly in communication with the Treasury on the whole question of village settlements and other kindred arrangements under which the tuberculous patient would, after training, be able to be employed under specially sheltered and favorable conditions.

A considerable part of the report of the Ministry of Health is taken up with a consideration and discussion of the venereal problem and in giving an account of the means taken by the Ministry for preventing and treating the disease. During the year 1919 the total number of patients dealt with for venereal disease for the first time amounted to over 98,000; of this total 15,500 had been proved on examination not to be suffering from venereal disease, a figure which seems to indicate that persons who are apprehensive that they may have contracted venereal disease are willing to avail themselves of the facilities provided for diagnosis and treatment. The attendance at the treatment centres during 1919 amounted to 1,003,000, as compared with 485,000 in 1918. The number of treatment centres open on December 31, 1918, was 134 as compared with 160 on December 31, 1919, but the increase in the facilities available was much greater than is indicated by these figures owing to a considerable increase in the number of clinics held each week. The work of the National Council for Combating Venereal Disease is favorably commented upon and it was agreed that a publicity campaign should be conducted by the agency of this body. The National Council submitted a program of special propaganda and publicity work estimated to cost £30,000 (\$150,000). The estimate was carefully scrutinized by the Ministry, and the sanction of the Treasury was obtained to a grant of not exceeding £20,000 (\$100,000) in respect of press advertisements, propaganda by cinema films, slides, and exhibits, by pamphlets, posters, and other literature and in respect of special propaganda in backward areas. During the year ended March 31, 1920, the Ministry paid grants in aid of venereal disease schemes amounting to £224,716 (\$1,123,580).

With regard to maternity homes and hospitals, the report states that institutional accommodation for confinements has in the past been provided in general maternity hospitals supported by voluntary subscriptions and in lying-in wards in infirmaries and workhouses provided by Boards of Guardians. The number of beds for maternity cases in general hospitals is difficult to estimate approximately, since in many instances no special accommodation is reserved for such cases. They are chiefly for complications of confinement, but a certain number of normal cases are also taken in hospitals which train medical students and pupil midwives. The number of maternity hospitals, according to the hospital return of 1915 issued by the Local Government Board, was eighteen, with about 560 beds. Nearly all Boards of Guardians have some institutional provision for maternity, either in the wards of the workhouse or in a separate infirmary. The Town

Council of Bradford was the first local authority to establish a municipal maternity hospital. This was in 1915, and since that date forty-five maternity houses and hospitals have been started, the majority by local authorities and the remainder by voluntary bodies working in cooperation with local authorities carrying out maternity and child welfare schemes. The accommodation which is provided in adapted houses comprises altogether about 500 beds. Apart from this, 300 beds for confinements exist in homes for unmarried mothers and their babies, although the general rule in these institutions is for the women to go to a lying-in hospital for her confinement, returning to the home afterwards. The policy of the Ministry has been to encourage local authorities as much as possible to provide accommodation for maternity cases. The shortage of houses and consequent overcrowding have emphasized the need for homes for normal confinements as well as for hospitals for complicated cases. The difficulty of building has rendered it necessary in most cases for an existing house to be adapted for the purpose, and suitable houses have been hard to obtain. Nevertheless proposals for about thirty-five additional maternity homes have been sanctioned or are now under the consideration of local authorities and of the Ministry.

As for children's hospitals, the report points out that the accommodation for the treatment of children under five in general and special hospitals supported by voluntary contributions has been supplemented in the course of the development of maternity and child welfare schemes in various ways. In maternity and child welfare centres which receive a large number of children the medical officer examines those who for some cause which is not immediately apparent are not making satisfactory progress. About twelve centres have provided observation beds in which these children can be kept until the reason why they are not thriving is ascertained, and a remedy for their condition can be applied. Such observation beds tend to develop into wards or small hospitals for ailing babies, and in sixteen other instances new infants' and children's hospitals have been established, frequently in connection with centres for children under five suffering from marasmus, rickets, and similar conditions not ordinarily admitted to general or children's hospitals. Hospitals for general diseases and illnesses for children under five have been established in five districts in which the hospital accommodation for children was inadequate, and more institutes for all of these classes are now being planned or considered. A hospital for cases of ophthalmia neonatorum has been provided by the Metropolitan Asylums Board. Altogether about 220 beds have been added to the hospital accommodation for children in connection with maternity and child welfare schemes.

Attention is drawn in the report to the fact that the passing of the Nurses Registration Act, in December, 1919, ended a controversy which had lasted some twenty years. The Act provides for the establishment of a General Nursing Council, two thirds of whose members should be nurses, the

remaining one-third being representatives of the departments concerned, of the medical profession and of the nurses' training schools. The first council is wholly nominated, but the act provides that in from two to three years' time when a sufficient number of nurses have been registered to form an adequate electorate, the nurse members of the second and all subsequent councils shall be elected by the nurses on the register. In accordance with the invaluable practice in establishing registers of this kind, the interests of existing nurses are fully safeguarded, and those engaged in bona fide practice as nurses for at least three years before November 1, 1919, may be admitted to the register without examination, provided that they apply for registration within two years after the date when the rules to be made by the General Nursing Council come into operation. Subsequent admissions to the register will be made only by examination after the prescribed training in an institute approved by the Council. Similar measures were passed establishing nursing councils in Scotland and Ireland, and provision is made in all three acts for reciprocal recognition by the various councils of nurses registered in other parts of the United Kingdom.

* * *

The other document which has just been issued is a report of the interdepartmental committee in relation to certain phases of national health insurance and is chiefly valuable by reason of its appendix, which is a memorandum on some of the medical aspects of the National Health Insurance Act by Sir James Mackenzie and the staff of the St. Andrew's Institute for Clinical Research. As mentioned in a previous letter Sir James Mackenzie, the great heart specialist who is known well by the medical profession of America, became convinced that much disease could be prevented from attaining serious proportions if the general medical practitioner was cognizant of some of the early symptoms of disease and was able by proper treatment to prevent these early manifestations from going further. As the general practitioner is the only medical man who has an opportunity to observe and study these early symptoms Sir James suggested that these, and especially the panel practitioners, should be taught how to detect such symptoms and treat them properly. Sir James not only suggested such a scheme but gave up his practice in London and founded the St. Andrew's Institute of Clinical Research in St. Andrew's, Scotland, for the purpose of carrying his views into effect. It is pointed out in the memorandum that though the vast majority of medical students become general practitioners no attempt is made to teach them how to make use of their opportunities in general practice and no hint is ever given them that the phases of disease which they will meet will be different than those they have seen in the hospitals. Consequently there is an urgent need for a definite course of training students in their last year as to how they should conduct their practices as panel doctors. If there was a scheme by which they could learn how to question a patient intelligently, how to make short but accurate

notes, how to watch the patient as he passes from one phase of disease to another, the working of the Insurance Act would year by year be greatly facilitated, while a great impetus would be given to the investigation of those dark fields of medicine which only the general practitioner can explore.

The memorandum goes on to point out that the system of specialization at present prevalent enables the specialist only to see disease at a late stage. Moreover, as in ill health there are reactions affecting several organs or systems, a man who restricts himself to the study of but one organ or system cannot acquire the power of detecting the primary cause of the patient's ill health. It is recognized that a general practitioner who makes a special study of the diseases of one organ or system is better qualified in that he has a wider experience and can therefore take a broader outlook of his patient's complaint, besides having an opportunity for seeing disease at an early stage. The following are the methods pursued at St. Andrew's Institute. 1. Each clinician has a private room in the institute. This is reserved from eleven to one on Mondays, Wednesdays, and Thursdays for research cases. During the rest of the day each practitioner may use his private room as a private consulting room. An index file and cards are provided in each room upon which brief notes are kept of each private or panel patient. These cards will, in time, form records of the life history of each patient. In the event of a patient removing to another district these notes can be sent to his new attendant. 2. Cases for research are selected from his own practice by each member of the clinical staff. These are first seen by him and he is at liberty to consult Sir James Mackenzie or any colleague at any stage of the case. If any special investigations are required, these are carried out by the staff of the special departments. 3. On Tuesday afternoons some special subject, arranged beforehand, is discussed by a general meeting of all members of the staff. 4. On Friday afternoons the whole staff discuss the cases seen during the week and any suggestions for investigation of any case made at that meeting are proceeded with and added to the record.

* * *

In an article on the Municipalization of Hospitals, published recently in the *British Medical Journal*, Dr. Charles Buttar describes the Municipal hospital in Bradford, emphasizing the importance of a study by the medical profession of the methods by which this institution was brought into existence and the proposals for its management.

Dr. Buttar goes on to say that for a long time there were no medical men in the city who confined themselves to purely consulting and specialist work and that, more than ten years ago, it was recognized that the buildings of the Royal Infirmary, where much of the institutional work was done, were out of date and insufficient, and a site for a new infirmary was acquired. But the £200,000 then thought necessary was never collected and the war interfered with the proposals for building. It appears probable that the project of the Bradford Municipal Hospital is to be legitimized by a clause in the

Ministry of Health bill. A site has been leased where there will be as little overcrowding of buildings, and as much open space as possible. This new hospital is expected to have 1,148 beds in ten pavilions; the medical ward to accommodate 502, and the surgical, 324 patients. To maternity cases 90 beds will be allotted, to children 84 and to infants 40. The remaining 108 are for venereal cases.

In order to build up the hospital on modern lines, it is proposed that the institution should consist of a number of small units, each composed of senior part time officer, physician or surgeon, an assistant (part time) and a resident officer. The City Council, which is responsible for the management, will delegate the care of the hospital to the Public Health Committee. The medical staff will consist of part time senior and assistant medical, surgical, and gynecological officers, and of the residents attached to the units. It is proposed that the senior officers shall be consultants or specialists employed for two hours each on four days a week. The remuneration suggested for this service is £500 a year. The assistant medical officers may be general practitioners, who would be employed for six hours a week, and be paid £300 a year. The residents will be whole time officers, and no suggestion seems to have been made as to the rate of remuneration to be paid them. Patients will be admitted through the outpatient department, which is to be open, apparently, to any inhabitant of Bradford, but which it is hoped will be fed from the various clinics, the outdoor Poor Law medical officers, and by general practitioners. No mention is made of emergency operations, which often occur in the night.

One interesting proposal in connection with carrying out the plan of the hospital is the matter of the senior medical officer. He is supposed to have a university degree or to be a Fellow of one of the Royal Colleges, and not to be in general practice, nor hold any other hospital appointment save with the consent of the committee. Now the committee proposes to purchase eight hours a week of a consultant's time, and it is a little difficult to see why they should be anxious to know what he does with the remainder of his time. May it not be that this provision may deprive them of the services of some of the more distinguished consultants?

The attitude of the population of Bradford toward municipal health enterprise is interesting. Some doctors assert that their practice among children has almost ceased. One doctor regarded Bradford as so municipalized that the City Council takes charge of the whole population "from conception to cremation."

It is proposed that charges shall be made to patients, according to the means of each, but no special amenities will be provided for those who pay the larger sums. All will be treated and fed in the same way.

Though the plan outlined above is interesting, the question is asked, why should attempts be made to fetter part time medical officers? Would it not be well for the Minister of Health to withhold approval of a scheme embodying such principles as these in Bradford until some measure of consultation with the medical profession has been achieved?

Editorial Notes and Comments

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ACUTE ADENOIDITIS IN CHILDREN.

This affection is of great practical importance. In infants and children up to the age of five years it occurs as frequently as it is overlooked. Usually these small patients are treated for almost every disease excepting the right one and in most instances the specialist is finally consulted for the complications. In practice, all that is necessary is to recall that there is such a disease as acute adenoiditis for the purpose of recognizing it, because its symptomatology is very special and really characteristic. The affection is especially frequent in winter and at the beginning of spring and autumn. In an infant or young child after coryza, a temperature develops; the baby becomes restless, sleeps poorly, snores and breathes with the mouth open. At the same time a paroxysmal and almost incessant cough develops of a type much like that of pertussis, allowing the patient little rest. The cough, usually dry unless there is a concomitant tracheitis, occasionally precedes in somewhat long paroxysms during the day but is much more accentuated at night when the child is lying down. It is not uncommon to find a temperature of 102° to 104° F. lasting for several days. Generally it lasts for five or six days, sometimes a fortnight or even a month. Even when long continued the child is likely to retain its appetite and eat as usual.

An examination of the throat will enlighten the diagnosis. The pharynx and tonsils are bright red and if the velum is pushed up a transverse line of accumulated mucus will be perceived at the upper

part of the cavum. This band of mucus varies in thickness and has a mucopurulent look. If the finger explores the parts adenoid growths will be detected immediately. The long duration of the process in some cases, the temperature and the difficulty in feeding may result in a certain degree of emaciation and change in the general health. On the other hand, complications of various kinds may arise such as bronchitis, bronchopneumonia, otitis, asthma, and laryngitis stridulosa.

Two types of the process deserve mention; a dry form with paroxysmal coughing, without secretion, and a catarrhal form with secretions and rise in temperature but without cough. The diagnosis is easy if the physician will only recall that acute adenoiditis is relatively common in young subjects, especially when the patient offers the characteristic facies of adenoid growths, and in infants when they sleep with open mouth and snore.

Auscultation will immediately eliminate bronchitis or bronchopneumonia. In simple acute tracheitis there are no nasopharyngeal symptoms, while tracheobronchial adenopathy can be also eliminated by the absence of presternal or interscapular dullness or subdullness. In whooping cough the paroxysms of cough are not so frequent, the affection is apyretic unless complications arise, and viscous mucus will be discharged with the coughing. Adenoiditis is prone to frequent recurrences and removal of the growths should be undertaken as soon as the inflammatory phenomena have subsided. In the infant, the treatment consists in disinfection of the cavum by morning and evening instillation of thirty centigrams of resorcin in twelve cubic centigrams of sterilized oil. In older children gomenol oil or solutions of protargol or collargol may be used, as well as irrigations with tepid water for removal of the secretions. The bromide salts are useless for controlling the cough and urethane is used in the daily dose of from twenty-five to fifty centigrams after the age of one year.

FRENCH RESEARCH ON GAS GANGRENE.

When gas gangrene appeared among the troops on the Western Front little was known of this serious complication of wounds. The condition had almost disappeared from peace time practice and the present medical generation had practically forgotten it. French medical men determined to learn all that was possible concerning it, so as to be able to treat it effectively. According to Dr. E. Sacquépée, professor at the Val-de-Grace, Paris, writing in the

French Supplement of the *Lancet*, September 18, 1920, these efforts have been directed above all to elucidate the pathogeny of the accidents. The complication was of an infectious nature and it was necessary to find out the species of microbe responsible for it.

Before the war knowledge of the pathogeny was as follows: Pasteur following Davaine in his study of experimental septicemia showed that the infection was due to the *Vibrion septique*. Chauveau and Arloing then demonstrated that this same germ also existed in gas gangrene in human beings. Clinical researches into the question then became difficult in France, since the first effect of the application of Pasteur's principles to surgery was to render gas gangrene extremely rare. On the other hand in foreign countries, especially in Germany and America, the study of certain new facts was possible. Welch and Fraenkel, and following them a number of other observers, charge Welch's bacillus, the *Bacillus perfringens* of French writers, with being the main cause of the condition. According to these authorities the *Vibrion septique* seems entirely eliminated as far as its influence goes.

The war gave opportunities for further investigations under favorable circumstances of which full advantage was taken. Welch's bacillus was found to be the predominant microbe implicated. The first work of the French investigation began in May and June, 1915, and was based on the following principle, i. e., that the best criterion of a pathogenic species is constituted by its ability to reproduce the malady experimentally. It was found that Welch's bacillus could reproduce the local lesions of the gangrene, but it could not be made to produce a potent toxin.

The investigators therefore thought that an examination should be made to determine whether there were not in the gangrenous tissues other pathogenic germs which comply better with the experimental criterion. In the majority of cases investigations in this direction gave an affirmative answer. They found either the *Vibrion septique* or a new bacillus which was later to receive the name of *Bacillus bellonensis*. In short, it was made clear that gas gangrene was associated with three species of organisms, Welch's bacillus, *Vibrion septique* and *Bacillus bellonensis* and the Inter-Allied Surgical Conference, which met at Paris, came to the same conclusion.

The results of the analysis of 121 cases under the French investigators' personal supervision were: Welch's bacillus, eighty-two per cent.; typical *Vibrion septique*, twenty-eight per cent.; nontypical *Vibrion septique*, eleven per cent.; *Bacillus bellon-*

ensis, thirty-five per cent. The germs were often associated in pairs. An analytical study of the *Bacillus bellonensis* showed that it is a highly pathogenic, very toxic species, capable of reproducing perfect gas gangrene experimentally. As for specific treatment, a knowledge of the causative germs, suggested the application of a specific serotherapy either against all three germs or against the germ involved in each particular case. The carrying out of this conception resulted in the preparation of three serums. The really great difficulty was to know which serum was to be used in each case. In most of the cases it was decided to inject all three simultaneously, although this was evidently only a makeshift procedure. Even so this method has given decided results. However, in the last months of the war a means of rapid pathogenic diagnosis was discovered, so that treatment can now be applied promptly on the right lines. Of course, from the preventive viewpoint this method of treatment is still more powerful, as Sacquépée points out, as it reduces the cases of gas gangrene to a small number of those wounds which are most exposed to it. French investigators clearly defined the pathogeny of gas gangrene and have employed serotherapy, curative, remedial, and preventive, with the happiest results, a really notable achievement.

PHYSICIAN-AUTHORS: DR. FRANCIS
BRETT YOUNG.

Dr. Francis Brett Young, the English poet and novelist, admits that when his father sent him to the University of Birmingham to study medicine he rebelled, for he was already afflicted with that seemingly incurable disease, *cacoethes scribendi*. "But I know now," he declares, "that there is nothing in the world that so fits a man of letters to wrestle with the mind of a man as an intimate acquaintance with his body. Literally and figuratively the doctor sees thousands of men and women naked; he sees the spring of curious motives, he shares strange secrets. A man or a woman will tell lies or feign emotions to the pastor or the lawyer; with the physicians they know that only the truth will help them. There is no education in humanity that compares with the doctor's life; and indeed, the names of great literary artists confirm this."

Unless he has given it up quite recently, Dr. Young is still practising medicine while at the same time writing novels. He took his degree in 1906 and immediately set out to see the world as a ship's surgeon, an easy berth which gave him plenty of leisure to gather impressions and put them on paper. In this capacity he saw the whole of the East, from Egypt to Korea and Japan and then settled

down in medical practice at Brixham, a fishing village in the south of Devon. "My patients at Brixham," he says, "were nearly all fishing people, speaking a racy dialect. Their life is the subject of the novel, *Deep Sea*, which distantly resembles Pierre Loti's *Pêcheurs d'Islande* and is dedicated to him." *Deep Sea* was not Dr. Young's first novel. The first, called *Undergrowth*, was written in collaboration with his brother, Eric Brett Young, and published in 1913. This was followed by a long critical study of the poetry of Robert Bridges, poet laureate, and in 1914 came *The Dark Tower*, which the author describes as "an exalted love story following the lines of the old tale of Pelleas and Melisande, with the mountain country of the Welsh border for its setting." He was writing *The Iron Age*, a story of the Black Country near Birmingham, when the World War broke out, and he finished it abruptly by packing his hero off to the war and then following suit himself. Young, having offered his services to the War Office as soon as they could find a substitute for him in civil practice, joined the Royal Artillery Medical Corps early in 1915 and spent the first two years of his service in East Africa. At the end of that period he had to return because of ill health, but continued to serve the colors until after the armistice, ending with the rank of major.

As a result of his experiences in East Africa he has given us two novels, the first, *Marching on Tanga*, and later, *The Crescent Moon*, perhaps the author's best known work. It was *Marching on Tanga* which brought his name into real prominence for the first time. "Written under a stress of emotion and exaltation in a rhythmical prose that too frequently breaks into blank verse," says Compton Mackenzie; "it is a remarkable record of a remarkable experience, and it already beautifully fills in the immense library of war books a space which is assuredly a permanent one."

There are two other novels and two volumes of poetry from his pen. The novels are *The Tragic Bride* and *The Young Physician*, the latter being admittedly autobiographical; the record of a youth's development, during the last half of which period the hero is seen at a medical school. Both volumes of poetry are largely expressions of the author's emotions in East Africa. They are *Poems 1916-1918* and *Five Degrees South*. The author describes *Five Degrees South* as "a sort of lyrical commentary on *Marching on Tanga*. The poems were slender, intimate things, written to my wife and one or two of them published in the *London Times* and the *New Statesman*, but since they have been published I am always coming upon people who prefer them to all my other work."

If we are to accept the verdict of the critics, the

fiction of Dr. Francis Brett Young is extraordinary fiction and the poems are extraordinary poems. Already his work has given him an international reputation that is growing rapidly. His poetry has met with universal acclaim. Reviewers have said that as a poet his work has a distinction and merit that is rare among the unending flood of jingling rhymes, blatant nonsense, and mediocre workmanship that is constantly being poured out. His novels, the critics say, show steady progress toward a high place in the literature of the next decade. No less a critic than Hugh Walpole says of him that "among the more romantic younger English novelists he is easily the first." A fine eye for landscape, plenty of exciting action, unhackneyed scenes and situations and a finely polished style, these are characteristics of Dr. Young's fiction. His output has been heavy, considering his medical practice, his war service and his age—he is only thirty-six, having been born in 1884, the son of a country doctor, near Birmingham. More than mere byproduct is this heavy output of literature, and it would seem to indicate that before long, if not already, Dr. Francis Brett Young and the practice of medicine will part company.

THE ETIOLOGY OF CUTANEOUS PIGMENTATION.

The pathogenesis and etiology of cutaneous pigmentation are unquestionably interesting but little known, and the divers notions we possess are, to say the least, hypothetical. The appearance of dyschromias appears to be related to external and internal causes, the former being the best understood. It is known that any irritation when somewhat intense and prolonged can give rise to pigmentation of the skin, but as Darier has pointed out, these fragmentary disturbances have for the most part the character of vital reactions against an irritant, and consequently their manifestations and intensity depend less frequently on the nature of the causal agent than on the reactionary tendency of the subject. Among the irritating causes, physical agents play an important part. For example, the production of sunburn is principally due to light and in particular to the chemical rays of the spectrum. Heat may be a factor in some cases and Neisser incriminates the caloric action of furnaces in cases of syphilitic dyschromia occurring in blacksmiths and bakers. In the same way non-chemical agents can give rise to pigmentation or at least can play a secondary part as localizing agents. Vitiligo and the so-called primary pigmentary syphilitide are frequently localized in areas chronically irritated, as has been shown by Thibierge and Finger. Finally, to conclude with the external causes, beside the parasitic dyschromias whose etiology seems to

be complex, it may seem logical to include those which are secondary to the dermatoses, such as the bullæ of pemphigus, herpes zoster, boils, papulonecrotic tuberculides, etc., as well as syphilitic lesions. The macula of roseola, secondary papules, and ulcerating lesions are the starting points of pigmentary change in which either a melanoderma or a more or less atrophic leucoderma are observed.

Still other causes of dyschromia have been invoked, both general and internal, whose mechanism has been diversely interpreted. Among them hyperemia should first be mentioned; it unquestionably intervenes in pigmentations having a local or external cause, for example, the melanoderma occurring on varicose limbs. Lesions of the suprarenal capsules have for some time been recognized as a cause of the melanoderma of Addison's disease, but space forbids a discussion as to what extent renal insufficiency or lesions of the pericapsular nervous plexus act as factors. If suprarenal insufficiency is incriminated, it should be pointed out that normally the suprarenals destroy pigment or a pigmentogenous substance and that when diseased they cannot do so. Or if a sympathetic theory is maintained, it will be said that when irritated a hyperactivity of the cells secreting pigment occurs. The sympathetic and cerebrospinal systems undoubtedly play a part in many dyschromias, as in leprosy, vitiligo, and the so-called primary pigmentation of syphilis. The latter does not belong exclusively to lues because it has been observed in tuberculosis and chlorosis. On the other hand, in many ways it is similar to the chloasma of pregnancy and Addison's disease, and it may well be asked if the syphilitic dyschromia is not also consequent upon some disturbance of the pericapsular nerves resulting from the *Spirochæta pallida*.

Other dyschromias have been regarded as due to hematic changes such as malarial melanoderma and perhaps bronze diabetes. According to Diday the blood of syphilitics undergoes a peculiar change in its coloring matter which allows it to become deposited in the tissues. If for any reason congestion arises, with a consequent increase of the blood in the skin, it will progressively infiltrate the integuments and finally the coloring matter will come near enough to the surface to produce a perceptible change in hue. Petresco likens the mechanism of the pigmentary syphilide to that observed in paludism; there is an exaggerated deposit of hemoglobin coming from the destroyed red blood corpuscles, hence melanin and its deposit in the tissues. Other observers have thought that the presence of bile pigments in the blood might be the origin of a good number of dyschromias, and perhaps syphilis, which does not spare the liver, produces pigments in this way. Finally certain disturbances of pigmentation have a toxic

origin, such as arsenical melanoderma and argyria. Although the etiology of dyschromia is poorly understood, this process can be divided into primary and secondary types. The first or spontaneous type is not preceded by an eruptive element. Secondary pigmentations are those succeeding an eruptive element, which was seated at the spot where the dyschromia, melanoderma, or achromia, according to the case, ultimately arises. In the first group can be placed the melanoderma of Addison's disease, lentigo and chloasma of pregnancy. In the second group of secondary dyschromias are the melanodermias or achromias following some local dermatosis, such as pemphigus, lichen planus and varicose ulcer.

MUSIC WITH WORK.

Transplanting rice in the Philippines costs about forty centavos a day, with two meals, cigarettes and betel nut, but when music is provided the output of work is increased thirty per cent. It is often a blind man who plays. He sits on the low rice dyke and sings the old folk songs to his guitar, and frequently the workers join in the chorus. Some of the large stores in the States also tried the effect of music, with good results. We have not heard much lately concerning music in hospitals and operating rooms; perhaps the patients were of the same opinion as the Socialist press, which says that all this welfare work is enlightened selfinterest. It proceeds without taking the trouble to find out whether such patronizing efforts are desired or appreciated.

News Items.

American Dietetic Association.—This organization will meet in annual session in New York October 25th to 27th, with headquarters at the Hotel McAlpin.

Mississippi Valley Medical Association.—This organization will meet in annual session in Chicago, October 26th, 27th and 28th, under the presidency of Dr. Frank B. Wynn, of Indianapolis, Ind.

Harvey Lecture.—The second Harvey Society Lecture will be given at the New York Academy of Medicine, Saturday evening, October 30th, by Professor Jules Bordet, director of the Pasteur Institute of Brussels. His subject will be Coagulation of the Blood.

Coroner's Physician for Monroe County.—The Civil Service Commission announces an examination for the position of coroner's physician for Monroe County, N. Y. Candidates must be licensed physicians and a residence of three months in the county is required; salary \$200 a year.

Cutter Lectures on Preventive Medicine.—Dr. Theobald Smith, of the Rockefeller Institute for Medical Research, delivered the Cutter Lectures on Preventive Medicine at the Harvard Medical School on October 19th and 20th, his subject being Medical Research and the Conservation of Food Producing Animals.

Yellow Fever in Mexico.—Quarantine measures against Tampico, Mexico, on account of yellow fever, were ordered on September 27th, to be enforced at Gulf and South Atlantic ports of the United States. During the four weeks from July 19th to September 18th, fifty-two cases were reported in Vera Cruz, with twenty-eight deaths, and on September 26th Dr. Hedrick, of the United States Public Health Service, died from the disease. In Tuxpan, during the month of September, there were twenty-one deaths.

American Association of Railway Surgeons.—At the seventeenth annual meeting of this society, held in Chicago, October 6th to 8th, Dr. Clarence W. Hopkins, of Chicago, was elected president and other officers were elected as follows: First vice president, Dr. Edwin B. Shaw, of Las Vegas, N. M.; second vice president, Dr. Joseph B. Wharton, of Eldorado, Ark.; third vice president, Dr. George W. Pirtle, of Carlisle, Ind.; treasurer, Dr. Henry B. Jennings, of Council Bluffs, Ia. (reelected); secretary, De Louis J. Mitchell, of Chicago (reelected).

Assistant Medical Officer Wanted at the Port of New York.—The Civil Service Commission of the State of New York announces an examination on October 30th for the position of assistant medical officer, office of Health Officer, Port of New York; salary \$1800. Candidates must be licensed physicians. The appointee must reside at City Island and give part of his time to the inspection of vessels from foreign ports and the examination of passengers and crews for the detection of quarantinable diseases, such as cholera, plague, typhus fever, yellow fever, smallpox, and leprosy.

Pharmacologist in the Bureau of Internal Revenue.—The United States Civil Service Commission announces an examination for pharmacologist to fill a vacancy in the Bureau of Internal Revenue, Treasury Department; salary \$2,500 to \$3,000 a year. Applicants must have an M. D. degree from an institution of recognized standing, and at least an A. B. or a B. S. degree from a college or university of recognized standing, and have had at least two years' postgraduate experience in experimental pharmacology or physiology, such experience to have included study of the physiological action of drugs. Additional credit will be given to applicants who show that they have a reading knowledge of French and German.

Lectures on Industrial Health and Preventive Medicine.—The Long Island College Hospital College of Medicine announces a series of lectures and practical demonstrations on industrial health and preventive medicine to be held during the collegiate year of 1920-21. The course on industrial health will be given in the form of twelve lectures and four demonstrations by Dr. Alfred Edward Shipley, director of the New York Industrial Health Bureau, who has recently been added to the staff of the college. Preventive medicine will be discussed in a course of fifteen lectures by Dr. Edward H. Marsh, assistant professor of preventive medicine and hygiene. These lectures will be free to licensed physicians. For full particulars write the head of the department, Dr. H. Sheridan Baketel, 350 Henry Street, Brooklyn.

Flower Hospital Asks Aid.—Flower Hospital has asked for subscriptions in order that the institution may be properly maintained and its ambulance service continued. It also desires to add sixty-five beds to the 200 now in use and to provide better quarters for the nurses. An expansion of the free work of the hospital is also contemplated. The ambulance service of Flower Hospital covers a territory of 275 city blocks in the heart of Manhattan.

Far Eastern Association of Tropical Medicine.—The fourth congress of this association will be held in Batavia, Java, in August, 1921, under the presidency of Dr. W. T. de Vogel, of the Civil Medical Service. Dr. Neeb, of Batavia, is secretary of the society. Among the countries which will be represented at the congress are the Philippine Islands, Australia, New Zealand, British India, Straits Settlements, Ceylon, the French and Portuguese colonies, China, Japan, and Siam.

Meetings of Local Medical Societies.—The following local medical societies will meet in New York during the coming week:

TUESDAY, October 26th.—New York Academy of Medicine (Section in Obstetrics and Gynecology); New York Dermatological Society; New York Medical Union; Metropolitan Medical Society; New York Psychoanalytical Society; Riverside Physicians' Association; Therapeutic Club; Valentine Mott Society; Washington Heights Medical Society; Woman's Hospital Society; Clinical Society of the Hospital and Dispensary for Deformities and Joint Diseases.

WEDNESDAY, October 27th.—New York Academy of Medicine (Section in Laryngology and Rhinology); New York Society of Internal Medicine; New York Surgical Society; Brooklyn Pediatric Society.

THURSDAY, October 28th.—Hospital Graduates' Club, New York; New York Physicians' Association; Ex-Intern Society of the Methodist Episcopal Hospital, Brooklyn.

FRIDAY, October 29th.—Hospital Graduates' Club, Brooklyn.

Personal.—Sir Berkeley Moynihan, C.B., M.S., F. R. C. S., of Leeds, England, read a paper on Gastric Ulcer and Its Treatment at a stated meeting of the New York Academy of Medicine, Thursday evening, October 21st.

Dr. James Francis Brady, of Boston, has been placed in charge of the Dermatological Department of Carney Hospital.

Dr. Byron G. Clark announces the removal of his office to 163 West Ninety-second Street, New York.

Mr. Ralph Mosteller, formerly assistant bacteriologist to the Board of Health of Atlanta, Ga., returned recently from Siberia, where for two years he had been in charge of the clinical laboratory of the Red Cross Russian Island Hospital at Vladivostok.

Dr. William W. Keen, of Philadelphia, was decorated recently with the Belgian order by the King of Belgium.

Dr. A. B. MacCallum, of Toronto, administrative chairman of the Research Council of Canada, has been appointed to the new chair of biochemistry in McGill University, Montreal.

Dr. W. D. Witherbee has resigned from the staff of the Rockefeller Institute for Medical Research and has opened an office at 116 East 53d Street, where his practice will be limited to x ray therapy. He will also have charge of the x ray work at the Presbyterian Hospital.

Conference on Venereal Diseases.—The All-America Conference on Venereal Diseases will be held in Washington, D. C., December 6th to 11th, under the auspices of the United States Interdepartmental Social Hygiene Board of the United States Public Health Service, the American Red Cross Society, and the American Social Hygiene Association. The administrative committee consists of Dr. Thomas A. Storey, Dr. C. C. Pierce, Dr. Livingston Farrand, and Dr. William F. Snow. The aim of the conference is to bring together recognized authorities and to make possible a comparison and evaluation of the methods now employed in various parts of the world for the control of venereal diseases. All correspondence should be addressed to the Executive Secretary, 411 Eighteenth Street, N. W., Washington, D. C.

Public Health Service Institute on Venereal Disease Control.—The United States Public Health Service has organized an institute on venereal disease control and social hygiene to be held in Washington, November 22d to December 4th. The faculty of the institute will consist of Dr. J. H. Stokes, of the Mayo Clinic, Rochester, Minn.; Dr. Hugh Young, of Baltimore; Dr. John A. Fordyce, of New York; Dr. E. L. Keyes, Jr., of New York; Dr. Thomas M. Balliet, Dr. William A. White, Prof. M. A. Bigelow, Dr. Katherine B. Davis, Mrs. Martha P. Falconer, and some thirty or forty other leading specialists.

During the ten days of the Institute four full courses and eleven half courses will be given. The first three full courses will consist of lectures on the diagnosis and treatment of the venereal diseases, and the fourth will be on delinquent women and their relation to the law. The half courses will be on the diagnosis of the mental condition of delinquent women; on protective work for girls; the work of the venereal disease nurse; heredity and eugenics; sociology and social hygiene; public education in venereal diseases; law enforcement; sex psychology; clinic management; and clinic social work.

Officers of State and city boards of health, clinicians, nurses, social workers, judges, and probation officers of courts of domestic relations and juvenile courts, police matrons, police women, superintendents of eleemosynary institutions, chiefs of police, medical officers of commercial institutions, urologists, dermatologists, gynecologists, neurologists, psychologists, and officers of medical and sociological organizations are all eligible for admission to the Institute. Others who wish to attend will be expected to present credentials from State or city health officers.

Application for admission should be made as soon as possible in order to enable those in charge of the institute to make arrangements for the educational facilities, comfort, and pleasure of the guests. No applications will be accepted after November 15th except by special direction of the Surgeon General. Applications that have been sent in may, however, be withdrawn, if circumstances make attendance impossible. No tuition is charged the generous cooperation of the faculty making this unnecessary. Hotel accommodations will be reserved if instructions therefor are sent to the U. S. Public Health Service, Washington, D. C.

Medical Society of the County of New York.—A stated meeting of this society will be held in Hosack Hall, New York Academy of Medicine, Monday evening, October 25th. The scientific program will consist of a symposium on blood transfusion, as follows: A General Introduction, by Dr. R. Ottenberg; Indications for Blood Transfusion, by Dr. R. E. Stetson; Selection of Donor, by Dr. L. J. Unger; Technic, by Dr. R. E. Brennan and Dr. Richard Lewisohn. Among those who will take part in the discussion are: Dr. Harold Hays, Dr. C. C. Heyd, Dr. E. Libman, and Dr. E. W. Peterson.

Medical Society of Pennsylvania.—At the twentieth annual meeting of this society, held in Pittsburgh, October 4th to 7th, under the presidency of Dr. Cyrus L. Stevens, of Athens, the following officers were elected: President, Dr. Henry R. Jump, of Philadelphia; president elect, Dr. Frank G. Hartman, of Lancaster; first vice president, Dr. Harold A. Miller, of Pittsburgh; second vice president, Dr. Spencer M. Free, of Duboise; third vice president, Dr. David Funk, of Harrisburg; fourth vice president, Dr. Anthony F. Myers, of Blooming Glen; secretary, Dr. Walter F. Donaldson, of Pittsburgh (reelected); assistant secretary, Dr. Christian B. Longenecker, of Philadelphia; treasurer, Dr. John B. Lowman, of Johnstown.

Died.

COMEAU.—In Norwich, Conn., on Friday, October 1st, Dr. George A. Comeau.

DYER.—In New Orleans, La., on Tuesday, October 12th, Dr. Isadore Dyer, aged fifty-four years.

GILSON.—In Boston, Mass., on Wednesday, October, 13th, Dr. Alfred H. Gilson, aged sixty-seven years.

KRAFT.—In Weehawken, N. J., on Thursday, October 14th, Dr. Charles Kraft.

MCCLANE.—In Clarksburg, W. Va., on Saturday, October 9th, Dr. William McClane, aged seventy-five years.

MORSE.—In New York City, on Sunday, October 10th, Dr. C. F. Morse, aged fifty-nine years.

NOBLE.—In Brooklyn, N. Y., on October 10th, Dr. Harriet I. Noble, aged sixty-one years.

RUPPEL.—In Lynn, Mass., on Sunday, October 10th, Dr. Emil F. Ruppel, aged sixty-one years.

SCHLEMM.—In Union Hill, N. J., on Sunday, October 3rd, Dr. Richard Schlemm, aged fifty-five years.

SIMMONS.—In Bangor, Me., on Monday, October 4th, Dr. William Hammatt Simmons, aged seventy-two years.

STEWART.—In Canandaigua, N. Y., on Tuesday, October 5th, Dr. Henry Stewart, aged seventy-three years.

STIRES.—In Columbus, Neb., on Thursday, September 30th, Dr. Ferd Taylor Stires, aged thirty-eight years.

SPAULDING.—In Clifton Springs, N. Y., on Thursday, October 7th, Dr. Frank W. Spaulding, aged seventy-six years.

STUTSMAN.—In Seattle, Wash., on Wednesday, September 22nd, Dr. William Harold Stutsman, of Chicago, aged thirty-four years.

THOMSON.—In Summit Point, W. Va., on Monday, October 4th, Dr. Augustus Pembroke Thomson, aged seventy-three years.

Book Reviews

PSYCHIATRY IN GERMANY

Arbeiten aus der Deutschen Forschungsanstalt für Psychiatrie in München. Edited in December, 1919. JULIUS SPRINGER, Berlin, 1920.

This first report of the new German Institute for Psychiatric Research is richly suggestive of the literary and scientific character to be expected of the contributions which will be made through its work. Kraepelin's review of the history of psychiatry through the hundred years preceding, with which the report opens, gives an instructive outline of the facts of such history presented with a stimulating appreciation of the evolutionary relation of such facts to one another. This becomes evident in a progressive field like that of psychiatry, which contains the promise for wider developments for the future as they gleam through the slow growth of the past. The somewhat familiar story of the abuses which arose through ignorance and superstition, and, we might add, through the fear of mental facts which these nourish, receives new light from Kraepelin's treatment. The story is set forth in clearly related detail, and thus, illustrated as it is also by pictures, it gathers together in striking summary the delays and yet the progress in theoretical and experimental approach to problems of the insane made simultaneously in the several lands of Christendom. It reveals the similarity and the cooperation which are in line with the definite progress of enlightenment and with the growing conception of a mental reality even in the insane which must be accepted and dealt with in a scientifically reasonable manner.

The promise for wider understanding of mental diseases in all phases of approach to them as well as for the possibilities of active development of the science of psychiatry is more than intimated in the writer's words. This prospective work is still more definitely outlined in his following article on the goals and the paths of psychiatric research. Further stimulus is given in his presentation of the needs of research into the various forms of mental disease. His article on epilepsy gives a brief glance also in one of these special directions. It does not lessen the force of his appeal for the various types of research, of which this report gives encouraging examples, if it is objected that too little attention is given to the general background of all mental disease and too little definite emphasis laid upon the weight of psychic factors which work much more deeply in the causation and development of mental disturbances than even this experienced observer makes clear. It is true as he says that there is not one mental disease but that research should proceed upon the admission of most devious paths for research. This is unquestionably true in the field of anatomical investigation; it cannot be disputed from the viewpoint of many psychic factors and countless deviations in the psychic expression of mental disease. Yet there is danger of too much distinction which tends to separate too sharply any disease manifestation from the whole background of personal character and of energy striving. The fuller acceptance of such unified background does

not confusedly merge different pathways of research but would obliterate falsely distinctive boundaries which too often shut out the more vital interpretation.

Such criticism would in no way detract from the high character of the special research reports which are published here. These fully indicate the scientific thoroughness and exactitude of the work that may be expected from the investigators working under this institute. The various subjects are treated with a completeness of detail, a fulness of description, and a wealth of illustration worthy of note.

A last word from Nissl appears in regard to the histological implications of the spirochete. He has also contributed an extended notice of Brodmann's work, whose death preceded Nissl's own. Spielmeyer has contributed a paper on the histopathology of the cortex in typhus, as well as a study of the relations between ganglion cell changes and gliosis phenomena. Plaut reports upon the Sachs-Georgi reaction in syphilis and together with Steiner upon recurrent infection in general paresis. Spatz has a study of a special manner of reaction of the immature central nervous tissue. There are also briefer reports of papers presented at meetings of the institute. Most of the articles of the collection have appeared in the *Zeitschrift für die gesammelte Neurologie und Psychiatrie* but all are here presented in convenient book form.

THE PROBLEMS OF PARENTHOOD

Problems of Population and Parenthood. Being the Second Report of and the chief evidence taken by the NATIONAL BIRTH RATE COMMISSION, 1918-1920. New York: E. P. Dutton & Co., 1920. Pp. v-423.

It was like a nightmare of immigration with no officers to control, no Ellis Island. All day, every day, there was a swift incoming of white babies, brown babies, black babies, crying, smiling, with well rounded limbs, with limbs distorted, splendidly healthy, woefully diseased, babies eagerly welcomed, babies unloved, unwanted. Some so spent with the journey that they soon fluttered back into the great silence, with no power of speech to tell their amazement at so blank a world. Those who stayed on grew to earn the name of "a problem" for though pocketless the rogues had brought in large stores of original sin and unoriginal disease, so that flurried philanthropists had to enlarge the reformatories and idiot asylums and devise means for only better babies to land in the world.

It was sad to learn at their last big meeting in London that men like Professor Leonard Hill and Dr. Saleeby had each a family of six and no means of bringing them up healthily; that Sir Rider Haggard and Professor Arthur Keith had only a two roomed lodging and no playground near for their children. That Miss Maude Royden and Dr. Marie Stopes, though warned of the social disabilities and the immorality, had children called children of shame, and the Bishop of Birmingham and Dr. Sims Woodhead had married at the early age of sixteen and preferred to live in a slum with their children rather than accept a fifty acre tract of land

the other end of nowhere with free air and water. Principal Garvie and Major Leonard Dawson were found incorrigible in preferring a glass of beer at the saloon every night to staying at home in their kitchen-parlor-bedroom while their wives washed up the supper things and the baby. Lady Selborne and Mrs. Bramwell Booth, though repeatedly warned, had trusted their three weeks' old babies to minders only ten years old, while they themselves went out to work when debts were many and pennies few. Mr. Sidney Webb and Sir Conan Doyle spent their evenings going to vaudeville and movies, though they both had a luxurious unwarmed, unventilated attic at two dollars a week and could have had pleasant evenings with books on racial degeneration and social hygiene from the free libraries. The accumulation of records during six years' work showed sixty thousand aristocratic lunatics to have married with an income of only nine thousand dollars a year. The daughters of the rich, though aware of the kind, winning treatment which the world would give, persisted in going wrong and wickedly refused to be restrained in a beautiful, cheerful home and do washing in order to go right. It was also found that Judge Henry Neil and Dr. Eric Pritchard, subway laborers, refused to take a bath each night at the public baths when work wearied, but unwholesomely ate unwholesome food unwashed.

But the reviewer had evidently become a little distracted with the appalling contents of the national cesspool. It was the people who were weak and foolish. The big people mentioned were met to discuss their reformation. But what had kept them decent citizens? Not leisure; they often worked harder than the workmen. Not education; that was free to all.

Well, the commission of rich and learned men and women discussed the prenatal, the postnatal baby; the care of the pregnant mother, the unmarried mother, the illegitimate father; whether help in avoiding venereal disease and care for love babies would increase vice. (Many thought it would). Who should emigrate and to what land? Is it wrong to arrest pregnancy? Decided—No nation can acquiesce in the destruction of children. It was found that the defensive and industrial powers of the empire are in danger if the increasing diminution of the birth rate continues, especially as the decrease is chiefly among those most capable of having healthy children. The questions of alcoholism, gonorrhoea, syphilis, tuberculosis, restriction of children earning wages, good housing, recreation centres, food, endowment of motherhood, were fully gone into, in fact, there was a mass of evidence from well known men and women which showed thorough and exhaustive, even sympathetic study. A special warning was given by Sir Rider Haggard to train the tide of emigration from England to her own colonies, and to combat the growing socialism which would like to keep emigrants out in case of having to share.

The choice of the commission was wonderfully wide: the evidence was fully reported and six years of it should bear weight, but it would be helpful to know why the commissioners were not being

judged as well as the people, or, if you prefer—masses, lower classes, submerged tenth. What has the rich man that the working man lacks, that he requires no investigation? The latter has free parks, education, medical care, libraries, museums, baths, assisted emigration, disablement pensions, clubs, music, everything save the certainty of wages, a suitable home and that home his own. He would rather have a small, healthy house, a little garden all his own, than live in a workman's model dwelling and have all Central Park free for his children to play in. Work as he will, a few weeks of involuntary idleness will exhaust his savings and risk his being turned out of his home. He has nothing he can call his own, and is humiliatingly forced to take anything a generous or a depraved municipality will offer. This is the greatest obstacle to reform: Uncertainty of labor and no sure dwelling place. Meanwhile it would advance progress if a commission were chosen to inquire why the rich needed no such agency.

BEYOND LAW.

The Rescue. By JOSEPH CONRAD. Garden City: Doubleday, Page & Co., 1920. Pp. iii-404.

Mr. Conrad's latest book is not entirely his latest conception. It embodies a theme which he bore around with him for many years, returning to it again and again until it took the form of the present novel. *The Rescue* is one of those marvelous Conrad works, all shimmering with color, filled with the mystery of strange seas and the high handed deeds of adventurers who were beyond law. In it the author tells of the attempt to rescue a kingdom of the South Seas, of a Malay princess and a British yacht, of a woman who was too civilized, and of a man who was "undone by a glimpse of paradise"—Captain Lingard or King Tom.

It would be futile to outline the story, for no mere indication of theme could give an idea of its penetrating analysis of human motives, of the richness of its setting, and of the exquisite prose. Mr. Conrad has chosen as his main character a figure of extraordinary interest. "Whatever he (Lingard) might have been he was not mediocre. The glamour of a lawless life stretched over him like the sky over the sea down on all sides to an unbroken horizon. Within, he moved very lonely, dangerous and romantic. There was in him crime, sacrifice, tenderness, devotion, and the madness of a fixed idea."

Lingard, the owner of a brig, has pledged himself to help Hassim and his sister, Immada, regain their kingdom of Wajo. Something of "the madness of a fixed idea" is in his determination. And then into his horizon comes the yacht of Mr. Travers, bearing with it all the decorum and dulness of British officialdom—and Mr. Travers' wife. "It seemed to him that till Mrs. Travers came to stand by his side he had never known what truth and courage and wisdom were."

The story does not seem to be told as much as to unfold itself, so absorbing are the persons concerned and so inevitable the denouement. Mr. Conrad is a master at this sort of thing. His characters seem to reveal themselves almost with-

out external aid, so deftly does the author encourage them. There are no undigested lumps of psychology; instead there is illumination in almost every gesture. With Mrs. Travers, Mr. Conrad is slightly less successful than in the depiction of King Tom. She remains something of a mystery, a woman whose disenchantment with life is hinted at but not fully revealed. We never really catch her off her guard. In the case of many writers who care as much about the setting as Mr. Conrad, the internal struggle of the characters might as well take place somewhere else. This is not so with *The Rescue*. One cannot imagine the drama of King Tom and Hassim and Edith Travers having been played out in another environment. King Tom himself is too representative of that life beyond law.

And yet real as this book is, compelling and beautiful as it is, it may easily leave the reader unsatisfied. Mr. Conrad is far too sympathetic with his characters to regard them as puppets, and yet in effect they are just that, in the sense that human beings everywhere are puppets. These people move in a setting that dwarfs them by its gorgeousness, small and helpless and terribly alone amid a sea and sky that have no concern with them, in a terrible, impersonal beauty that only emphasizes their isolation. One feels in the author's attitude that same detachment, the absence of a word of hope.

A NEW DISSECTOR.

The Anatomy of Society. By GILBERT CANNAN. New York: E. P. Dutton & Co., 1919. Pp. v-216.

Gilbert Cannan, who wields one of the most trenchant pens among the younger English novelists, has written a book which is part treatise, part sermon and part prophecy, which is vehement and incoherent and at times splendid. It is a rather young book. Dissecting society is a large order. Mr. Cannan keeps up a verbal barrage against capital, restrictions on divorce, tyranny, institutionalism, and every sort of exploitation. He believes in freeing parents from their children and from each other when desirable, in reclaiming the school, in socializing industry—in freeing the human spirit. Interesting, but difficult. Dissection is an operation which should be attended with calmness, and Mr. Cannan is not calm. He hits society on the head with an axe and considers the job done.

INTERRUPTED LAUGHTER.

The Broken Laugh. By MEG VILLARS. New York: Robert McBride & Co., 1920. Pp. vii-343.

If one were given two guesses as to Miss Villars's favorite reading matter, the first would be the novels of Compton McKenzie and the second the *Ladies' Home Journal*. She has not achieved the blend of farce comedy and metaphysics of the Sylvia Scarlett novels; in place of the metaphysics are bits calling for an emotional tear or two if one is that sort of person. But the foundation is McKenzie—snappy narrative built around an obscure little person who is no better than she should be, complications interwoven with what the newspapers call human interest, a dash of sentiment—the whole designed to keep the reader up all night if he is unfortunate enough to start it in the evening.

The heroine is named Kissy, and as a result of gullibility and ignorance she has a baby the father of which she does not even know. Her journey to Paris after she has identified the man by a newspaper clipping and the subsequent adventures that befall her when she learns her mistake form the theme of the story. Miss Villars is not quite as snappy as Mr. McKenzie and the narrative drags in spots, particularly toward the end. The conclusion is a nicely tempered bit of justice. Miss Villars does not want to be too hard on Kissy, neither can she exonerate her after the baby and her ending is nicely calculated to obviate both of these courses.

TALKS.

Ten Minute Talks With Workers, from *The Times* (London) Trade Supplement. Pp. 208. New York: Doubleday, Page & Co., 1920.

There are many shoutful, aggressive arguers who delight to get an audience and choke them with phrases. Many such use terms of which they know not the exact meaning themselves or as little as those they talk to. Now if the bullied will carefully study these *Ten Minute Talks* they will understand the terms used in labor and capital, profits and wages, banks and markets, and be able to use staggering arguments to discomfit the windbag of words next time he comes along, for the book is clearly written.

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

PEARLS ASTRAY. A Romantic Episode of the Last Democracy. By CONSTANCE M. WARREN. Illustrated. Boston: Small, Maynard & Co., 1920. Pp. 158.

PATHOLOGISCHE BIOLOGIE. (Immunitätswissenschaft.) Dritte Auflage. Von Prof. Dr. HANS MUCH. Leipzig: Verlag von Curt Kabitzsch, 1920. Seiten 323.

AMERICAN MEDICAL BIOGRAPHIES. By HOWARD A. KELLY, M. D., LL. D., F. A. C. S., Hon. F. R. C. S. (Edin.), and WALTER L. BURRAGE, A. M., M. D. Baltimore: The Norman Remington Company, 1920. Pp. xix-1320.

DIE THERAPIE AN DEN BONNER UNIVERSITÄTSKLINIKEN. Herausgegeben von Prof. Dr. RUDOLF FINKELNBURG, in Bonn, Dritte, vermehrte Auflage. Bonn: A. Marcus & E. Webers Verlag (Dr. Jur. Albert Ahn), 1920. Seiten xii-745.

THE VICTORY AT SEA. By Rear Admiral WILLIAM SOWDEN SIMS, U. S. Navy, Commander of the American Naval Forces Operating in European Waters During the Great War, in Collaboration with BURTON J. HENDRICK. Garden City-New York: Doubleday, Page & Co., 1920. Pp. xi-410.

DIAGNOSTIK UND THERAPIE DER KINDERKRANKHEITEN. Mit speziellen Arzneiverordnungen für das Kindesalter. Ein Taschenbuch für den praktischen Arzt. Von Prof. Dr. F. LUST, Oberarzt der Universitäts-Kinderklinik in Heidelberg. Zweite neubearbeitete Auflage. Berlin N-Wien I: Urban & Schwarzenberg, 1920. Seiten vi-471.

PATHOGENIC MICROORGANISMS. A Textbook of Microbiology for Physicians and Students of Medicine. By WARD J. MACNEAL, Ph. D., M. D., Professor of Pathology and Bacteriology and Director of the Laboratories in the New York Post-Graduate Medical School and Hospital, New York. Second Edition, Revised and Enlarged. Illustrated. Philadelphia: P. Blakiston's Son & Co. Pp. xx-488.

Practical Therapeutics and Preventive Medicine

A Compendium of Treatment and Prophylaxis, Original and Adapted

Radium Puncture in the Treatment of Cancer.

—C. Regaud (*Paris médical*, February 7, 1920) notes that radium puncture consists in introducing, into a tumor for example, needles charged with radium. By suitable implantation of the needles a high degree of evenness in the exposure of the tumor tissues to the radium can be obtained. The treatment is very economical in the sense that, for equal effects, it requires much less radioactive energy than does the external application of radium. In a thick tumor mass, a few millicuries introduced with the needles yield greater effects than would several hundreds of millicuries used externally. In the last eight months the author and his coworkers have used radium puncture in about fifty miscellaneous malignant tumors. Too little time has as yet elapsed to speak of cures, but there have occurred at least temporary remissions in the cases, all inoperable, so far treated. The method undoubtedly marks a great step forward in the treatment of malignant growths, both because it affords new possibilities in the treatment of certain rather inaccessible forms of cancer and because it procures an increase of therapeutic efficiency in the treatment of relatively insensitive and bulky tumors. While highly efficacious, radium puncture is harmless only when radiation of healthy tissues is avoided. An illustrated description of the armamentarium and technique is presented.

Treatment of Congenital Dislocation of the Hip.—Calot (*Bulletin de l'Académie de médecine*, April 20, 1920), from extensive anatomical and pathological studies, as well as from x ray, clinical, and therapeutic observation in several thousand children treated for congenital dislocation, found that hitherto x ray specialists and surgeons have nearly always misjudged the location of the upper margin of the primitive cotyloid fossa, into which the head of the femur must be finally adjusted if true anatomical cure is to be obtained. This upper limit is not situated at the uppermost and outermost point of the diagrammatic V representing the cotyloid region in x ray textbooks, but at the apex of the V, i. e., at the upper part of the Y cartilage. Because of this anatomical error, incomplete and false reductions, rather than true reductions, have been obtained. The primitive cotyloid fossa corresponds in small children to the ischial and not the ilial portion of the coxal bone. A mistake has also been made in placing the axis of the head and neck of the femur in an oblique direction. Instead, this axis should, on x ray observation, be found horizontal. The head should be opposite the ischial portion; the neck should appear in its greatest length, and contact, or better, insertion of the head and cotyloid fossa should be obtained. If this is not possible at first, it may be gradually secured by pressure with cotton upon the great trochanter through an opening for it in the plaster apparatus opposite the trochanter. A broad, horizontal vault for the head must be created at the proper point.

This is accomplished both by keeping the axis of the head and neck transverse throughout the period of immobilization and by flexing the thigh to an angle of 135° in the first apparatus used. This overflexion also serves to correct the frequently existing anteversion and antetorsion of the head and neck. Autopsies and radiographs showed that a roof for the cotyloid fossa as horizontal, strong, and extensive as on the normal side can thus be created in from eight to twelve months. The newly formed roof or vault appears in the x ray picture as stalactites and islets of bone which later become confluent. Equivalent changes take place even in the very small children, in whom ossification is normally less advanced. To avoid undue encroachment upon the femoral head by the bony proliferations above it, the head is not left in a fixed position throughout the eight to twelve months, but is moved through the use of three successive plaster dressings, the first holding the thigh flexed at 135°, the second at 90°, and the third at 45°.

Chemotherapy of Chronic Tuberculous Infections.—H. Grenet and H. Drouin (*Bulletin de l'Académie de médecine*, March 9, 1920) refer to the experiments of A. Frouin which showed that intravenous injections of the sulphates of samarium, lanthanum, neodymium, and praseodymium induce an intense, progressive, and lasting mononuclear leucocytosis, and that *in vitro* the same salts cause definite alterations in the vitality, morphology, and chemical constitution of the tubercle bacillus, the fat content of which is reduced from thirty-five or forty per cent. to twenty-two or even sixteen per cent. Clinically, intravenous injections of a two per cent. solution of one of the above mentioned compounds—usually neodymium sulphate—were given in series of twenty or twenty-five, daily or on alternate days, repeated after intervals of fifteen or twenty days. The dose was gradually increased from two to five mils of the two per cent. solution. The injections were well borne in cases of local tuberculosis or with small pulmonary lesions and in fair general health. In more severe pulmonary cases the treatment caused temporarily slight lassitude and loss of weight. In hectic cases and those with extensive cavities the treatment was not tried. In eight cases of tuberculous lymphadenitis marked improvement followed one or two series of injections, the glands becoming smaller, movable, hard, and fibrotic, and long standing sinuses closing in fifteen to twenty days. In eleven cases of lupus erythematosus and two cases of indurated erythema rapid improvement usually occurred, the lupus cases sometimes being cured in a few days, or, where of longer standing, after one or two series of injections. Among twenty-four cases of true skin tuberculosis, weeping and suppurating lesions were soon dried up, and later healing took place, in some instances with scarifications or the cautery as auxiliary measures. Lupoid tubercles of the nasal mucosa were cured without local treatment. The pulmonary cases

treated included three in which, in spite of manifest physical signs, no tubercle bacilli had been found before the beginning of treatment, and twenty-one with tubercle bacilli, subcrepitant or crackling râles at the apexes, rough breathing, prolonged expiration, etc. In the first group, all physical signs disappeared and apparent recovery was secured in from two to six months. In the second group, expectoration ceased in four after two to seven months of treatment; the bacilli apparently disappeared in eight; râles disappeared in all but one of these twelve cases. In the remaining nine cases of the second group tubercle bacilli were still present after treatment, but always showed morphological changes, becoming narrow, branched, and agglutinated, or stout, short, and irregular in outline, invariably with poor staining properties. X ray examinations showed improvement corresponding to that noted in the physical signs. In brief, all patients were benefited by the treatment.

Colloidal Arsenic and Silver in the Treatment of Influenza.—Capitan (*Bulletin de l'Académie de médecine*, March 9, 1920) reports recent cases illustrating the value of intravenous or intramuscular injections of colloid arsenic and silver in grave influenza cases. In a case seen with Tertois, the patient was a man aged ninety years with double basal bronchopneumonia, subnormal temperature, and delirium. In addition to the ordinary measures, such as cupping, camphor in oil, strychnine, and sparteine, intramuscular injections of two mils of colloidal arsenic into the buttocks, morning and evening, were administered. Progressive improvement followed, and after four days the dose was reduced. Complete recovery took place. In the same patient's wife, aged seventy-seven, and likewise gravely ill, injection of two one mil doses of colloidal arsenic and two three mil doses of colloidal silver was followed by defervescence in twenty-four hours and eventual recovery. Similar results were obtained in other cases. The colloidal preparations employed are advantageous in being nontoxic and in acting rapidly.

Iodine Absorption from the Human Skin.—Norman C. Wetzel and Torald Sollmann (*Journal of Pharmacology and Experimental Therapeutics*, April, 1920) report experiments in which iodine tincture was painted on the palmar surface of the forearm and other iodine preparations rubbed thoroughly into the skin of the chest and abdomen. Contrary to the widely prevalent impression that free iodine is absorbed quite readily through the skin, the urine did not contain demonstrable quantities of iodine compounds. Failure to excrete iodine does not necessarily mean that none is absorbed, for if only very small amounts have been absorbed it is conceivable that they may be retained completely in the body. Yet the experiments are held to have shown that the absorption of iodine through the skin is not nearly as extensive as is commonly supposed. The results obtained referred only to single applications to normal skin. Probably if the skin is injured, as by repeated applications of strong iodine solution, its permeability may be increased. This would doubtless occur if there were actual vesication, or probably even if the epidermis had been desquamated.

Treatment of Enterocolitis in Infancy.—W. W. Harper (*Southern Medical Journal*, June, 1920) says that to treat enterocolitis successfully, one must make a distinction between the cases due to the gas bacillus and those due to the dysentery bacillus. The former thrives best on a carbohydrate diet, so this infection is best combated by withholding carbohydrates and giving proteins, while carbohydrates furnish media not favorable to the growth of the dysenteric group of organisms and is the food of preference in the early stages of such infection, although there are subjects who do better on a protein diet. Again, the infection may be principally in the lower ileum, or in the lower colon; in the former case there is early and profound toxemia, rapid desiccation of the tissues, a marked tendency to acidosis, and often a severe nephritis. Absence of lactic acid bacilli indicates that the intestinal canal has surrendered to the invading bacteria. The treatment is as follows: 1. Prompt cleaning of the intestinal canal by catharsis and enema; 2, withdrawal of all food for twenty-four to forty-eight hours; 3, sowing the intestinal canal with virile strains of lactic acid bacilli; 4, an abundance of water by mouth, rectum, and hypodermoclysis; 5, free administration of alkalis and, if acidosis threatens, the use of carbohydrates; 6, adopting measures to prevent urinary suppression; 7, early return to breast or bottle.

As an initial purge the writer prefers castor oil. If the first dose is vomited, a second is given at once, and if this is vomited a third. From the three doses enough will be retained to act. An enema of two teaspoonfuls of sodium bicarbonate to a quart of warm water is given every six hours for the first day or two. All food is withdrawn and water forced. To encourage the drinking of water, it may be given as iced tea, lemonade or orangeade, sweetened with saccharine. If the baby refuses to take the fluids, or if there is marked nausea or emesis, sterile tap water should be supplied by hypodermoclysis, six to eight ounces every six to eight hours to an infant six months old. Should acetone appear in the urine, the solution should contain one per cent. citrate and two per cent. glucose. A less preferable method of introducing fluid is through the stomach or duodenal tube. The least satisfactory method is by proctoclysis. As soon as the castor oil is out of the stomach, give a lactic acid bacillus tablet in sweetened water every two hours; these to be continued until the stools are normal. As acidosis is the great danger, the urine should be kept alkaline with bicarbonate of soda, or sodium citrate, five to ten grains every two hours to a child six months old; it is rarely necessary to continue this longer than forty-eight hours. If the baby is breast fed nursing is resumed at the end of twenty-four to forty-eight hours, the baby to nurse one minute from each breast every four hours, to be preceded with lime and plain water. If the infection is due to the gas bacillus, the baby is given lactic acid milk, or protein milk, before each nursing; this replaces the lime and plain water. If the infection is due to the dysentery bacillus, the nursing is preceded by a

lactose barley solution, varying in strength from two teaspoonfuls each to two tablespoonfuls each to the pint of water. If the baby is bottle fed, the same treatment is carried out except as to the nursing. Although carbohydrates are contraindicated in gas bacillus infections, they must be given in threatened acidosis. Toxic nephritis with impending anuria is best combated with hot baths, hot packs, and warm soda flushes of the colon. For restlessness give chloral by enema, or morphine by injection. As a stimulant, atropine in fairly large doses gives good results. Now and then one will meet with a case of vasomotor paralysis which can be benefited by an intravenous injection of adrenalin. When the stools are large, frequent and watery, opium is often a life saver; paregoric by mouth or morphine by hypodermic injection. For tenesmus the writer likes an enema of silver nitrate solution, one half to one per cent., in distilled water. Intestinal antiseptics and astringents are mentioned only to be condemned.

The Therapeutic Use of Oxygen.—R. D. Rudolf (*American Journal of the Medical Sciences*, July, 1920) says that oxygen is of value whenever a state of anoxemia exists, as in cases of mountain sickness, sickness from high flying, in poisoning by carbon monoxide, nitrites, and arseniuretted hydrogen, and in the effects of enemy gas. It should be tried in all cases of cyanosis, and in such acute respiratory conditions as pneumonia when anoxemia threatens. The ordinary method of giving oxygen by holding a funnel connected with the oxygen cylinder near the face of the patient is practically useless; a better method is to give the gas through a rubber tube inserted into one nostril, and this may be made more effectual if the opposite nostril is rhythmically compressed during inspiration, the mouth being kept closed. The oxygen chamber is a very effectual way of giving oxygen, but it involves much expense and care. A very useful and effectual appliance for the administration of oxygen is Meltzer's apparatus for oral insufflation.

Vaccine Therapy in the Acute Osteomyelitis of Adolescents.—Raymond Grégoire (*Journal de médecine de Paris*, April 5, 1920) states that in certain selected cases of this disorder vaccine treatment gives excellent results. In the septic form of osteomyelitis prompt surgical treatment is, of course, indicated, though vaccine treatment might prove of some value as an auxiliary measure. In the acute or subacute cases, in which the general condition is less seriously impaired, the advisability of vaccine treatment depends entirely upon the state of the involved bone. Where a more or less extensive portion of bone has become transformed into a sequestrum, vaccine treatment is inappropriate and the foreign substance must be surgically removed. Such a condition is detected by x ray examination. In all other cases, however, irrespective of the duration of the case, extent of local inflammatory reaction, and condition of neighboring joints, vaccine therapy may yield surprising results. Cases were thus cured after several weeks of suppuration and fever. Where purulent accumulation about the bone is excessive and threatens to open

into a joint or cause marked separation of tissues, it is well to puncture the abscesses, repeatedly if necessary, until the pus becomes clear and finally ceases to form. Joint involvement would at first sight seem to demand incision. Yet in several cases distended joints went on to recovery without it and even recovered their mobility, wholly or in part. To avoid persisting with vaccine treatment for more than a reasonable and safe period, reliance should be placed on the temperature curve. The vaccine tends to subdue the temperature very rapidly. In some cases it drops quickly from 39° or 40° C. to about 37°, though frequently several days are required for it to reach normal. Whenever the vaccine acts, there is noted a distinct depression in the temperature. If by the third day no remission has occurred, the vaccine may be considered insufficient in the case under treatment, and open surgery should be resorted to at once.

Pituitary Syndrome Coexisting with Spinal Deformities.—Apert and Cambessédès (*Presse médicale*, January 31, 1920) report the case of a boy of twelve who for some years had been exhibiting general torpor, somnolence, headache, and increasing obesity. The hips and breasts enlarged so as to resemble the feminine type and the pubes began to show a premature growth of hair. The extremities were cold and cyanotic. The sella turcica was found broadened. In addition, the child had presented at birth an upper dorsal meningocele, which had been subjected to operative treatment. X ray study of the back showed multiple malformations of the vertebræ. It is supposed that the same condition of dysembryoplasia involved simultaneously the spinal and pituitary regions, the latter constituting, as a matter of fact, the upper extremity of the spinal tissues.

X Ray Treatment in Primary Neuralgia.—A. Zimmern (*Paris médical*, February 7, 1920) reports marked benefit in cases of occipital, trigeminal, and lumbar neuralgia and in meralgia paresthetica from radicular x ray treatment. With the exception of the cases of facial neuralgia, particularly those of the tic douloureux type, the results obtained were remarkably constant. They were especially rapid and complete in neuralgia of the brachial plexus. Only rather small doses of the rays need be used. One or two applications averaging three H units, with filtration through two or three millimetres of aluminium, proved sufficient to bring about complete cure or at least to allay the pain very greatly. In the brachial cases the irradiation should be practised over an area extending from the fourth cervical to the first dorsal, and be directed obliquely from behind forward and from without inward. The patient should be warned that a few hours after the first treatment there may occur a painful, though never severe, reaction preceding the ultimate sedative effect. This reaction seemed, however, to occur less frequently in the brachial cases than in cases of sciatica similarly treated. With the doses mentioned, one remains below that required to produce erythema even if it becomes necessary to repeat the treatment every week. Furthermore, with a sufficient degree of filtration no trace of pigmentation can occur.

Proceedings of National and Local Societies

AMERICAN GYNECOLOGICAL SOCIETY.

Forty-fifth Annual Meeting, Held in Chicago, May 24, 25, 26, 1920.

Dr. ROBERT L. DICKINSON, of New York, in the Chair.
(Concluded from page 608.)

Operation or Radium for Operable Cancer of the Cervix.—Dr. WILLIAM P. GRAVES, of Boston, stated that his paper was an inquiry, based on personal experience, into the question of the treatment of choice in operable cases of cancer of the cervix. The subject was opportune because of the recent severe criticisms that some of the radium enthusiasts had cast on the modern operative methods of treating cervical cancer, and because a few excellent surgeons had of late practically discarded surgery for radiation in this field.

Dr. Graves reviewed the cases of cervical cancer which had come under his observation and that of his associate Dr. F. A. Pemberton. During a period of eleven years 181 cases were seen, of which 114, or sixty-four per cent., received radical operation (deducting three cases in which operation was refused.) Of the 114 operations ninety-nine were performed by the Wertheim technic. In fifteen the Wertheim method was considered too dangerous, and a complete hysterectomy was performed in the usual manner. There were six operative deaths in the series, making an immediate mortality of 5.2 per cent. Of postoperative disabilities due to the operation there was one vesical fistula and one rectal fistula. The five year curability percentage at the time of writing was 27.6 per cent.—34.2 per cent. according to the particular method used in computation. These figures seemed to refute in some degree, at least, the criticisms of operative treatment on the ground of "low percentage of operability, shockingly high immediate mortality, and a large majority of distressing and desperate sequela."

Dr. Graves then reviewed his personal experience with radium in the treatment of cervical cancer. Radium in his hands had proved to be an invaluable agent in the palliation of inoperable cases. Many brilliant primary results had been achieved but, as a rule, the ultimate results had been disappointing, there being only one case which he could at present confidently pronounce cured.

On account of the danger of fistula formation from burns, radium had been discarded in frankly operable cases, either before or after the operation. If the operation had been unsatisfactory so far as a complete extirpation of the disease was concerned, radium was used as a prophylactic against recurrence. In numerous borderline cases, difficult of operation, the patients were treated first with radium and then operated upon. In most of these cases there were recurrences ultimately.

Dr. Graves concluded that there was as yet nothing in his personal experience with radium to justify giving up the radical operation in operable cases. He, however, called attention to the fact that the results of radium treatment observed at the Memorial Hospital, New York, were superior to his own

and ascribed this superiority to a greater knowledge and experience in radium, to the possession of larger quantities of the radium element, and to a more elaborate and efficient technic of application. He stated therefore, that the conclusions from his own personal results should not be generalized at present.

A New Method of Covering Raw Surfaces Upon the Uterus.—Dr. GEORGE GELLHORN, of St. Louis, stated that the practitioner started to do a Gilliam operation or one of its numerous modifications or substitutes in a case of fixed retroflexion. The adhesions that held the uterus glued to depth of the cul de sac or the rectum were broken up, the round ligaments were shortened and the uterus was now lying in a more normal position, but with a more or less extensive area of denudation on its fundus which invited the speedy formation of new adhesions. The difficulty was easily solved by a procedure the various steps of which were given by the author in the following words: "The fundus is grasped by a volsellum and pulled backward and upward in the direction of the promontory. The reflection of the bladder peritoneum upon the cervix which now becomes plainly visible is incised transversely as in a hysterectomy and pushed off from the uterus. If this blunt dissection with the finger is gentle enough and does not extend into the broad ligaments, the bleeding is usually insignificant and is quickly checked by the pressure of a sponge. The uterus is then tilted forward, the bladder peritoneum is pulled over the uterus and stitched to the posterior aspect of the fundus, where an intact peritoneal surface presents itself. In small uteri, the bladder peritoneum may be fastened as far back as the insertion of the sacrouterine ligaments, if necessary. After the first or second turn of this continuous catgut stitch the volsellum is removed and the stitching is continued until the entire fundus with its denuded area has disappeared beneath its new peritoneal covering. By using an inverting stitch, even the catgut knots become visible. The newly formed covering consists only of the bladder peritoneum which, in many cases, is so thin and transparent that the raw uterine surface and even the volsellum holes may be distinguished."

The method just outlined not only supplied the raw fundus with a new serous coat, but it also safeguarded a normal position and mobility of the uterus, and the late results had remained most satisfactory. It was, however, not to be relied upon exclusively in a case of fixed retroflexion. In such a case the order of the operative steps were these, viz., first, loosening of the bladder peritoneum as described above; second, shortening of the round ligaments; third, fastening of the bladder peritoneum to the back of the uterus beyond the area of denudation. He anticipated two pertinent questions. Was the function of the bladder disturbed after this procedure, and what happened to the bladder in a subsequent pregnancy? In the six or seven years that he employed the method, he had never observed an instance of vesical disturbance other than those that might follow any laparotomy.

Lutein Cysts Accompanying Hydatiform Mole.

—Dr. W. A. COVENTRY, of Duluth, Minn., said that the cases which he reported presented several very interesting features: 1. The appearance of the ovarian tumors in one case appeared with the mole (in fact, clouding somewhat the history of mole), and in the other case seemed to arise and start to grow rapidly after the mole had been removed. 2. The gross and microscopical appearances of these cysts were in marked contrast to those of the ordinary type of ovarian cyst. 3. These multiple lutein cysts were beyond a doubt different from those normally appearing during pregnancy. 4. These lutein cysts undoubtedly accompanied only the formation of chorioepithelioma and mole and were probably not to be found in any associated condition. There were many references in the literature to the occurrence of cysts of the ovaries accompanying pregnancy, mole or chorioma, but he was sure that many of these references were only to small cysts, which disappeared spontaneously after expulsion of the mole or the fetus.

As regards prognosis and treatment, Eden and Lockyear asserted that some of these cysts receded following the expulsion of the mole, and some such cases had been recorded by Russell, Andrews and Albert, but this literature was not available. Findley stated that occasionally cystic ovaries became greatly reduced in size following delivery of the mole, and reported in the fifty-eight cases collected by him that in only four was there any retrogressive change following the expulsion of the mole. Still, he did not specifically state that these were large lutein cysts such as described in this condition. In view of the fact that the literature in the large majority of cases connected this condition with the presence of chorioepithelioma, and also in view of the fact that the condition was undoubtedly a retrograde metamorphosis from the normal cystic conditions found in the ovary, he believed that we were perfectly justified in not waiting for the recession of these tumors but that we should operate and remove them when found.

MEDICAL SOCIETY OF THE STATE OF
NEW YORK.

*One Hundred and Fourteenth Annual Meeting,
Held in New York, March 23 to 25, 1920*

The President, Dr. CLAUDE C. LYTLE, of Geneva, in the
Chair.

(Continued from page 344.)

The Abduction Treatment of Fracture of the Neck of the Femur.—Dr. ROYAL WHITMAN, of New York, stated that he had presented this method before but that the results obtained by it had been so highly satisfactory that there was no reason for abandoning it. For the restoration of function it was essential that deformity be reduced and that the fractured surfaces be fixed in contact. Contact could be assured only by adapting the outward fracture to the inward. To accomplish this the patient must be anesthetized, and the shortening was then reduced by direct traction. The thigh, having been lifted to the proper plane, was abducted to the normal limit, and abduction was effected

with the perineum against a perineal support. Abduction turned the fractured surface down to meet the head of the femur; it made the capsule tense and aligned fragments; it relaxed muscles whose contraction tended to displace the fragments; it apposed the trochanter to the side of the pelvis, or, if the fracture was near the head, engaged the neck beneath the rim of the acetabulum and provided a mechanical check to displacement. What was known as impacted fracture was usually a complete fracture. After reduction the body and limb were covered with sheet wadding and cotton flannel bandages, all bony points being carefully protected, and a long plaster spica support was applied. With the fracture thus dressed the patient could be turned completely over on the abdomen, avoiding bed sores and also the danger of hypostatic pneumonia. The head of the bed was elevated at an angle of twenty-five degrees, providing a semi-reclining position which favored the nutrition of the injured parts. The neck of the femur in young, vigorous persons might be broken by slight violence and the fracture might not cause complete disability. The bad prognosis usually given for fractures of the femur was not warranted, and was largely due to incorrect technic. He had treated many elderly persons by the abduction method with gratifying results. His oldest patient was a woman eighty-nine years of age who lived to be ninety-three.

Urological Diagnosis in the Practice of the General Surgeon.—Dr. LEO BUEGER stated that modern urological investigation with highly developed urological instruments and practice in their use made available to the urologist many special procedures not ordinarily employed by the general surgeon. The general surgeon could cooperate with the urologist to his own advantage and to that of his patient. There was great need for educating young men in the field of urological diagnosis, for here many mistakes were made. For instance, calculus of the ureter might give symptoms simulating intestinal obstruction and even peritonitis, and operation might be performed when it would have been possible to remove the calculus through the urinary tract. Urinary calculus in the lumbar region might be taken for retrocecal appendicitis. When there were signs of urinary retention, calculus should be suspected. In some cases of supposed subacute or chronic appendicitis vaginal examination revealed the presence of ureteral calculus low down. Tuberculous nodules in the ureter might be mistaken for calculi. Ovarian disorders had been diagnosed in cases in which a cystoscopic examination would have revealed intraureteral debris. The indications for and method of employing the retention catheter were discussed and lantern slide demonstration showed what the urologist could discover by means of the shadow graf catheter, the pyelograph, which though its use was restricted, was important in certain cases; the baby cystoscope, which had aided in the diagnosis and treatment of pyelitis in children; the Bueger opera cystoscope, which carried a scissors-like instrument which made possible certain operative procedures on the bladder, and the direct, indirect and retrograde cystoscopes.

Surgical and Nonsurgical Treatment of the Prostate and Seminal Vesicles in Arthritis.—Dr. OSWALD S. LOWSLEY, of New York, stated that the teeth, tonsils, sinuses, and various other focal infections had received attention in their relation to arthritis and he wished to call attention to the part played by the prostate gland and the seminal vesicles in the production of this condition. His observations were based on a study of 100 cases of arthritis in the urological department of Bellevue Hospital. The ages of these patients ranged from seventeen to fifty-one years, the average being twenty-nine and one third. The season of the year did not seem to make any difference except that there were not quite so many cases during the summer months. The joints affected, in the order of frequency, were the knee in fifty-three, the ankle in forty-four, the wrist in thirty, and the foot in twenty-six. The infection was traced to the teeth in thirty-one cases and to the tonsils in ten. Twenty-three per cent. of the patients denied having had gonorrhoea. The impression that infection arising from the prostate and seminal vesicles was usually gonorrhoeal was incorrect. An analysis of these cases showed other organisms predominating in this locality such as the *Staphylococcus aureus*, *Streptococcus viridans*, and other forms of streptococci. In three of the cases brilliant results were obtained with vaccines. In a number of cases treatment by steaming was very satisfactory. Ten cases were treated surgically with good result. Where there was chronic seminal vesiculitis, seminal vesiculectomy was preferable to vesiculotomy. Of fifty cases of polyarthritis in which infection from other sources was eliminated, examination of the prostate and seminal vesicles showed these to be the source of the infection. In searching for the source of infection in any case of arthritis the prostate and seminal vesicles should not be overlooked. Autonomous vaccines were extremely valuable in same cases used in conjunction with other methods of treatment.

The Rôle of the Colon Bacillus in Infections of the Kidney.—Dr. HUGH CABOT, of Ann Arbor, Mich., said that, excluding tuberculosis, the colon bacillus was found to be the infecting organism in a large proportion of kidney infections. The number of these infections did not seem to be decreasing. The most common and perhaps the most important kidney lesion was pyelitis. Of this condition there were two groups of cases: In the first there was no demonstrable reason for the infection in the urinary tract, while the second group was dependent upon urinary outflow. The second class presented the least difficulty. These cases were dependent upon stricture, stone in the bladder, or other obstruction to the urinary outflow in the urinary tract itself. Such obstruction, however, was not the only factor, but was merely instrumental in preparing for infection. He did not believe instrumentation of the urinary tract was frequently the cause of infection. Where there was residual urine associated with lowered resistance the soil was prepared for infection. The so-called catheter system following operation was open to criticism. It was too much the custom to delay catheterization and trust

that retention would not occur, and it was too frequently assumed that catheterization was responsible for infection. So long as patients were catheterized by the clock, just so long would infections continue to be a reproach to the physician. All these patients should be regarded as likely to have retention. The bladder should never be allowed to become distended above twelve ounces. If early catheterization was carried out, postoperative cystitis would become a rarity. The first group of cases was that in which kidney function might be below normal and the cause lay outside the urinary tract. In this group pressure from the outside produced interference with the urinary outflow, leading to congestion, which prepared the soil for the infecting organism. In this group came the pyelitis of pregnancy as well as the so-called spontaneous cases associated with disease of the large intestine, such as mucous colitis and ulcerative colitis. There was also a group of cases occurring in adult life, particularly in women suffering from constipation and visceroptosis, and another group, in female children in which we had been accustomed to blame the condition on the anatomical conformation. If these infections in female children were due to the introduction of the colon bacillus by way of the urethra, it was strange that they were not more common. Experiment had shown that introduction of the colon bacillus into the bladder did not produce pyelitis, and clinical experience was against this view. It might well be that the colon bacilli affected the kidneys of those who had little resistance. The use of formaldehyde in local irrigation of the kidneys had been much in vogue, but it had failed to live up to its temporary reputation. It was quite strange that patients with a stormy onset and severe symptoms were most likely to go on to complete recovery, while chronic cases often resisted treatment. Attempts with autogenous vaccines might at times relieve the symptoms but failed to remove the infection. He was not sure they had pushed the use of autogenous vaccines to their logical conclusion. There was need of further study of bacilluria, and perhaps conditions in the large intestine might give a clue to the treatment of pyelitis.

Dr. EDWARD L. KEYES, JR., of New York, asked Dr. Cabot concerning the relation of the passage of instruments into the ureter to pyelitis. Attempts to wash out the pelvis of the kidney had not proved satisfactory. It was possible that a certain amount of benefit might be due to the straightening out of the ureter by the passage of the instrument employed in giving the irrigation.

Dr. A. W. BRASCH, of North Germantown, questioned whether the large intestine was the etiological factor in pyelitis. It was his impression that the connection between the colon and the kidney was limited. In treating pyelitis he removed the foci of infection in the teeth or tonsils if any were present and then employed lavage of the kidney pelvis with silver nitrate, placing the patient in the Trendelenberg position. He passed good sized bulbs that straightened out any stricture which might be present, and he believed this cured pyelitis in a large proportion of cases.

(To be continued)

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A SERIES OF FOREIGN BODIES IN THE BRONCHI AND ESOPHAGUS.*

By HENRY LOWNDES LYNNAH, M. D.
New York

In the presentation of this series of foreign bodies in the food and air passages, I wish to call attention to the difficulties often encountered in the removal of some of the intruders, the mechanical method of removal, and also the comparative ease in which many of the uncomplicated foreign bodies may be removed.

In the removal of all sharply pointed objects, such as pins and tacks, great care should be taken to see that the point is disengaged from the bronchial wall before removal is attempted. Faulty manipulation of a sharply pointed foreign body may place it in such a position in the bronchial wall as to render its removal extremely difficult, if not impossible. The prolonged sojourn of a foreign body in the bronchus makes the removal much more difficult than one that has been recently aspirated. Long standing foreign bodies in the bronchus are usually surrounded by granulation tissue. There is also a stricture of the bronchial wall, with a resultant bronchiectasis or pulmonary abscess below the foreign body or stricture, due to the retention of pulmonary secretion of long duration. Patients with bronchiectasis and pulmonary abscess usually improve, and even get entirely well, after the removal of the obstructing foreign body and pumping out of the sponge soaked lung and establishment of proper lung drainage. Bronchoscopic dilatation of the remaining stricture and evacuation of the bronchiectatic cavity may be necessary several times before the cavity is finally obliterated. These are only a few of the complications which may arise in bronchoscopic foreign body extraction; the difficulties and dangers however are numerous, and perforation of the bronchial wall and sudden death of the patient from pneumothorax has been known to occur in the attempted removal of sharply pointed foreign bodies, and one case is recorded where the bronchus was ruptured accidentally on the introduction of the bronchoscope. Therefore, extreme care on the introduction of the bronchoscopic tube, and gentle manipulation of the foreign body should be constantly before the operator who wishes to successfully remove foreign bodies from the bron-

chi and esophagus with a minimum amount of damage being caused.

The difficult removals encountered in this series were the sharply pointed objects, one of which was transfixed, and the impacted foreign bodies, at times completely covered with edema. As a rule smooth objects are extremely difficult to grasp with forceps, and are therefore difficult to extract. The esophageally lodged foreign bodies, such as coins, are as a rule easy of removal, especially when the operator sees the patient before several unsuccessful attempts and much traumatism have been made.

At times the foreign body is buried in a dense ring of edema, which renders its exact localization problematical, and its removal in these instances is extremely difficult. The irritation and inflammation produced by the lodgement of metallic foreign bodies in the bronchi are not nearly as pronounced as the result of inspired nuts and food of any sort. The longer the lodgement of a bronchial or esophageal foreign body the greater the danger to the patient and the more difficult the removal. At times the very innocently lodged penny in the esophagus may slough through into the trachea and the patient succumb to pneumonia.

The most extremely irritating substances bronchially lodged in this series were found to be raw carrot, parched peanut kernel, masticated toilet paper pulp, cheesy infectious material from the tonsil, meat and casts of diphtheritic membrane. All of them were looked upon with extreme suspicion as diphtheria, for the symptomatology and physical signs are much the same. In bronchial diphtheria asthmatic respiration is usually present and this is also an accompaniment of all irritating substances inhaled into the lung. The onset in the fulminating types of bronchopulmonary or asthmatic types of influenza simulate these types of foreign body. closely, both in characteristic symptoms and physical signs, where there is no history of foreign body inspiration. Given a case with such symptoms, negative radiographic findings mean nothing, and the only means of one being able to arrive at a definite diagnosis is by a bronchoscopic examination. When such substances are inhaled by young children, which is frequently the case, they wheeze and rasp and are profoundly prostrated. There is often a marked pulmonary emphysema on the side of the obstruction, for air is much more easily inspired by the foreign body than expired. Therefore, the lung necessarily compensates in turn by

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a marked ballooning. The x ray may show a depressed diaphragm in such cases, on the affected side. If the effort at inspiration by a tight obstruction is kept up for many hours the child soon becomes exhausted and death may rapidly follow. In one of these cases there was such an enormous



FIG. 1.

FIG. 1.—(Case I.) Shawl pin removed from right superior lobe bronchus.



FIG. 2.

FIG. 2.—(Case II.) Shawl pin removed from left upper lobe bronchus.

amount of pulmonary emphysema that the lung ruptured, and there was a generalized tissue emphysema just prior to death. There is always extreme cyanosis when pulmonary or tissue emphysema appears.

CASE REPORTS

CASE I. Shawl pin in right superior lobe bronchus of a woman thirty years of age, referred by Dr. Ard, of Plainfield, N. J. In bronchus twenty-five hours. By radiographic and bronchoscopic examination the point was deeply imbedded in the opposite bronchial wall. The head of the pin had entered the upper lobe orifice as far as it could go, while the point was transfixed in the opposite bronchial wall. The shaft of the pin presented across the mouth of the bronchoscopic tube and neither head nor point was visible. The head of the pin could not be pushed farther into the upper lobe orifice to release the point and a very difficult mechanical problem presented. The point of the pin by lateral radiographic measurement had penetrated deeply into the opposite bronchial wall. To attempt to remove the pin in the position presenting would only court failure and attempting to pull it out would prove disastrous by causing a rupture of the bronchial wall.

With a nine mm. bronchoscope *in situ*, the head and neck of the patient were rotated well to the right, for the transfixed and buried point had to be attacked in the bronchial wall on the opposite side. The long slanting tip of the bronchoscopic tube was used to press out the bronchial wall just above the imbedded point while the side curved forceps partly open covered the shaft of the pin and gradually followed it up towards the point while pressure was made with the bronchoscopic tube lip. By keeping the blades of the forceps in such position they acted by gentle counter pressure on the bronchial wall and at the same time were in a position to grasp the pin point as soon as it was released. After seventeen minutes the point was released and as the forceps were in position it was grasped. Now the head of the patient was moved to the left and the

pin easily extracted in the normal manner. Had the head not been rotated well to the right it would have been next to impossible to disengage the point.

The patient had been a sufferer for a long time from a substernal goitre and the x ray revealed an enormous thymus gland. While the patient had received a dose of morphine and cocaine, the cough reflex was not affected locally, and an extremely irritating cough from which she had suffered for a long time persisted during the entire operation.

CASE II. A girl aged sixteen referred by Dr. William Dougherty of New York. The girl gave a history of having swallowed a shawl pin some five days before and had no cough or discomfort after it had disappeared. A radiographic picture taken by Dr. George S. Dixon showed the pin to be located in the upper cervical region. There was considerable swelling of the neck of the patient and she complained of pain in her throat from an attempted removal before admission. The patient had some difficulty in swallowing. The patient was prepared for an esophagoscopic examination and the spatula esophagoscope was introduced without anesthesia. There was no pin in the larynx. There was a long rip in the cricopharyngeous constrictor and esophageal wall and the swelling we had noted in the neck was due to subcutaneous emphysema, no foreign body was visible. As the pin had disappeared the patient was sent again to the radiographic room and another picture taken of the entire chest and abdomen.

The chest plate showed the pin to be lodged in the left bronchus with the point in the upper lobe orifice. As the patient was in a very poor condition from the esophageal rupture no anesthetic was

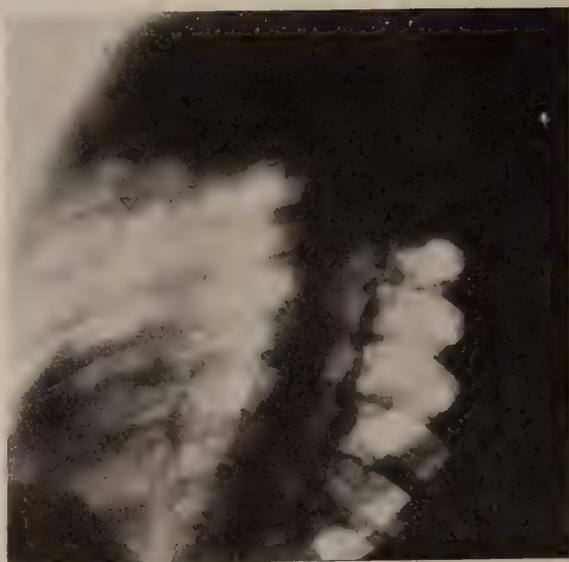


FIG. 3.—(Case I.) X ray picture showing shadow of shawl pin.

used. A dose of morphine was administered and the pin was rapidly removed through a seven mm. tube. The point of the pin was in the left upper lobe bronchus, but it was easily pushed downward after grasping the shaft with forceps and disengaged. The removal of the pin from the bronchus taking three minutes. After the removal of the pin the esophagus was inspected.

There was a long slit in the esophagus, the edges of the wound were covered with a thick slough. A suction tube was introduced into the wound and with a twenty inch vacuum some foul smelling material was removed. The wound was then swabbed with tincture of iodine. As the patient



FIG. 4.—Shawl pin in the larynx supposed to be in the upper esophagus. Radiographic plate taken before attempted removal from the esophagus. (Case II.)

had been unable to swallow for the past twenty-four hours and was suffering from water hunger, milk and water were injected by syringe into the stomach through the esophagoscope. A soft rubber stomach tube was then introduced and the patient fed by the syringe method through the proximal end of the tube which extended out of her mouth. The tube was attached to the neck by tape to prevent its becoming dislodged and swallowed. By this time there was marked emphysema of the neck and face and the temperature had risen to 103.2° F. The pulse was weak and rapid. The patient was at all times conscious, and her chief complaint was a severe stabbing pain in the region of the sternum on inspiration. There was a booming systolic heart sound over the entire precordial region. The second sound could not be elicited. Scattered râles were elicited over the anterior aspect of the chest, but these were probably due to the crackles of the subcutaneous emphysema in this area. The following day after a thorough dose of the water cure treatment, the patient requested that the tube be removed. This was done and the wound in the esophagus was again swabbed with iodine after thorough evacuation of the pocket. The feeding tube was then replaced. This treatment was continued from day to day and by the end of the first week the patient showed signs of improvement. The temperature was 101.4°, pulse 110 and regular and respirations 32. There was a pleuritic rub over the region of the sternum but the heart sounds could be distinctly heard. By the tenth day the patient continued to show improvement but strenuously objected to the method of feeding. The esophagoscope was passed and the wound inspected. The wound had almost completely healed but there was still an inflammatory

exudate about it. This was probably protective for there was no foul odor. The patient was given a swallowing trial with a glass of milk and did fairly well. The reintroduction of the feeding tube was discontinued. By the end of the second week the girl was able to be up and about and by the end of the fourth week she was able to leave the hospital. She could swallow without difficulty at this time and the esophageal wound had completely healed. The patient was seen a year later and there was no stricture of the esophagus and no difficulty in swallowing. A radiographic plate taken at this time showed the lungs and precordial region to be normal. It is extremely interesting to note the difference in the two radiographic plates. The one taken just after the accident before an attempt was made to remove the pin from the cervical esophagus and the other after the attempted esophageal removal and rupture of the esophagus. Air entered the mediastinum and it can be definitely made out in the radiographic plate taken after the esophageal rupture.

CASE III. A boy aged seven was admitted to the Kingston Avenue Hospital suffering from measles and croup. There was a large perilaryngeal abscess present which Dr. Cannon, the resident physician, recognized as the probable cause of the croupy symptoms. As the abscess was opened there was a blast of air through the wound and much pus was sucked in with inspiration. The child was immediately inverted and a quantity of foul smelling pus was drained from the abscess cavity. Then the wound was examined and found to communicate with the trachea. On examination of the tracheal fistula Dr. Cannon saw an object in the wound and as he opened the tracheal fistula the object dropped into the lung. The following day a radiographic



FIG. 5.—Radiographic plate taken on admission after an attempted removal of pin from the esophagus. Note that the pin was dislodged from the larynx and was found in the left bronchus. The white area over the base of the heart is due to mediastinal pneumothorax. Compare this plate with the one taken before the esophagus was ruptured. (Case II.)

plate was made which showed a closed safety pin in the right main bronchus. By peroral bronchoscopy through a five mm. tube the pin was located and easily extracted in four minutes. The

larynx looked not unlike a larynx following prolonged intubational tubage, but it readily returned to normal. The tracheal fistula healed in the usual manner. The child had been treated for diphtheria and croup for six weeks, and it was only after he was admitted to the hospital for measles that the

first trial. Neither of us was able to grasp the head of the screw at the first trial with the forceps at hand, for there was a firm ring of edema above the head of the screw which almost completely hid it from view. It was evident from the radiographic plate that the screw was a large one and the head



FIG. 6.

FIG. 6.—Safety pin removed from right main bronchus (Case III).
FIG. 7.—Dental root brooch removed from left superior lobe bronchus (Case IV).



FIG. 7.



FIG. 8.

FIG. 8.—Carpenter screw removed from lung (Case IV).
FIG. 9.—Metal intubation tube from right main bronchus (Case VI).



FIG. 9.

true nature of the cause of the croup was recognized. The boy made a complete recovery and there was no stenosis after a year.

CASE IV. Dental root brooch in left superior lobe bronchus. The patient was a young lady aged seventeen who inhaled the tooth canal reamer which slipped from the fingers of the dentist. Dr. Fidler saw the patient and after having taken some excellent radiographic plates referred the patient to me for removal of the foreign body. The brooch was in the left superior lobe bronchus for thirty hours. Under local anesthesia the brooch was readily extracted through a seven mm. bronchoscope in two minutes. No sign of the presenting hair like point could be seen in the mouth of the left upper lobe bronchus until the patient's body was rotated well to the right. In this position a small hair like point

must have been considerably larger than the diameter of the bronchus into which it had entered; nevertheless it had worked its way downward by its ratchet movement as far as it was possible to go.

After fifteen minutes' trial further attempts at removal were discontinued and a second trial was to be made a week later. In the interval I had a special pair of alligator forceps made which would dilate the stricture above the head of the screw and at the same time grasp it firmly. A week later a second attempt was made to extract the screw by upper bronchoscopy, and after Dr. Arrowsmith had worked for a few minutes he decided that it would be advisable to remove the screw by tracheotomic bronchoscopy owing to the massive head of the screw which was bound to cause much traumatism if removed through the glottis, and the resultant secondary sub-



FIG. 10.

FIG. 10.—O'Dwyer tube removed from bronchus (Case VII).
FIG. 11.—Intubation tube removed from right bronchus (Case VIII).



FIG. 11.



FIG. 12.

FIG. 12.—Intubation tube removed from right bronchus (Case IX).
FIG. 13.—Noncoughup tube removed from right bronchus (Case X).



FIG. 13.

was visible lying on the floor of the bronchus. It was gently grasped by straight forceps and removed. The patient recovered.

CASE V. Carpenter screw in the lung of a boy of two years. I had the good fortune to see this case with Dr. Arrowsmith whom I assisted at the

glottic edema would necessitate tracheotomy later. Dr. Arrowsmith performed a low tracheotomy with the five mm. bronchoscope *in situ*. After working for a short time Dr. Arrowsmith's eyes became very tired and he gave me a second trial at removal. I had the good fortune to have the blades of the for-

ceps dilate the edematous stricture above the foreign body and engage it and the screw, forceps and bronchoscope were removed through the tracheal fistula. Had not Dr. Arrowsmith's eyes become tired I would never have had a chance to remove the foreign body as he would have worked a few



FIG. 14.—X ray shadow of dental brooch removed (Case IV).

minutes longer and removed it himself. The cannula was successfully removed and the child made a complete recovery.

CASE VI. Metal intubation tube removed from the right main bronchus of a child of two years. The child was admitted to the Kingston Avenue Hospital suffering from laryngeal diphtheria for which she was intubated. A large dose of antitoxin was administered and as the general condition of the child was good on the fourth day an attempt was made to remove the tube. The tube was lost during the attempt and was thought at first to have been coughed up and swallowed, for the child had little discomfort and breathed well through the larynx. During the afternoon the child had some difficulty in breathing but intubation was not considered necessary. The case was referred to me for bronchoscopic examination, and on the introduction of a five mm. tube the head of the tube was seen to be in the right bronchus. The lumen in the head of the tube was entered with the extracting forceps and it was removed through the mouth. As the head of the tube was much larger than the glottis there was some traumatic subglottic edema which followed and the child again became croupy, but reintubation was not necessary. The child made a complete recovery.

CASE VII. A special O'Dwyer tube with large retaining swell and head was accidentally shoved down during the act of digital extubation. The tube, a three year size, was introduced into one of the coughup cases owing to the great diameter of the retention swell. The tube gravitated downward

owing to the absence of the cricoid cartilage which would have ordinarily held it in place, had not the cartilage sloughed out as a result of perichondritis which is the chief factor in all cases of coughing up of the tube. As the head of tube had gravitated downward, there being no cricoid cartilage to hold it in position, the added attempt to remove it shoved it down into the bronchus below. The child immediately became cyanotic and an emergency tracheotomy was performed. The tube was removed through the tracheotomic fistula. The child recovered but became one of the postdiphtheritic retained tracheal canula cases. He was eventually decannulated and made a complete recovery.

CASE VIII. A two year intubation tube removed from the right bronchus in a child aged two and a half at Riverside Hospital. The usual thing occurred at attempted extubation by the digital method that the tube head was pushed through the glottic opening and fell into the bronchus. A second tube was introduced after the first tube fell into the bronchus but as this gave no relief tracheotomy was performed and the tube was extracted by tracheotomic bronchoscopy, a five mm. tube being used. The child was greatly improved following the removal of the tube but as she had a bronchopneumonia before the accident which continued to spread she succumbed two weeks later.

CASE IX. A two year intubation tube removed from the left bronchus in a boy of two years and nine months. The boy was admitted to the Willard Parker Hospital and intubated for laryngeal diphtheria. A large dose of antitoxin was administered and as the general condition was good on the fifth day a digital detubatory trial was made. The at-



FIG. 15.—X ray showing location of carpenter screw removed from the lung (Case V).

tempt to remove the tube was unsuccessful at the first trial and several attempts were made. Finally the operator said that he could not feel the tube. An attempt was made by the resident physician to locate the tube but this was unsuccessful. The writer was notified of the condition and removed the tube the same afternoon with some difficulty

through the mouth. The child became stenotic a few hours after the removal of the tube and reintubation was necessary to relieve subglottic edema. The tube was worn for one week and removed by the direct method. The child remained without the tube and made a complete recovery.

CASE X. A one year noncoughup tube removed

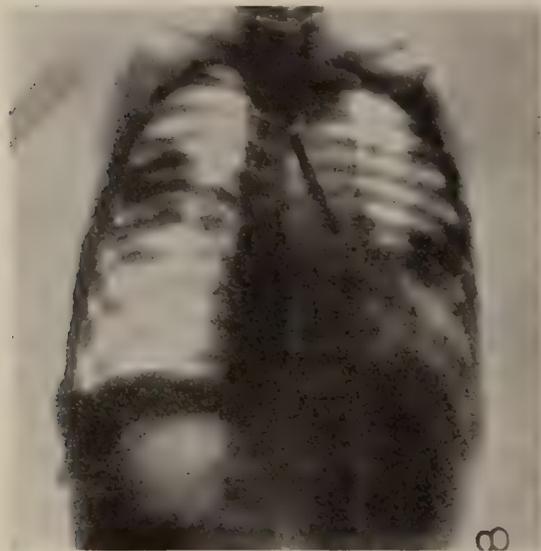


FIG. 16.—Intubation tube shown by x ray removed from right bronchus. (Case VIII).

from the right bronchus of a child aged a year and half. The child was admitted to the Kingston Avenue Hospital and intubated with a one year O'Dwyer tube. After a large dose of antitoxin the child improved but was unable to remain without the tube at the first trial. During the second week the child started to cough up the tube, and one of my noncoughup tubes was introduced. This tube was retained and put a stop to further trouble. One week later one of the staff while attempting to remove the tube shoved it down into the bronchus. At first the tube was thought to have been extracted and swallowed, for there was little discomfort following the lodgement in the bronchus. A radiograph showed the tube to be in the right bronchus. The child had so little discomfort from the tube in the bronchus that at first it was thought impossible, until the child became stenotic five days after the accident, the afternoon of the same day that the x ray was taken. I attempted to remove the tube after the introduction of a five mm. bronchoscope and while the tube could be brought up to the glottis it could not be extracted. A tracheotomy was performed with the bronchoscope as a guide and the tube removed by the straight extractor through the tracheotomic fistula. The child wore the tracheal cannula for a long period after the removal of the tube but was eventually decannulated and made a complete recovery.

CASE XI. A small piece of toilet paper in the right lower lobe bronchus in an infant of eight months. The case was referred by Dr. Angelo Smith, of Yonkers, N. Y. The infant was in the habit of putting paper in her mouth and the nurse who had been left in charge of the baby probably

paid little attention to her during the absence of the parents. When the nurse returned to the room she found the child choking. She immediately put her finger in the mouth of the infant and removed several pieces of toilet paper. The child was in *extremis* and Dr. Smith was notified. When I saw the child a few hours later she was in poor condition. The lungs were ballooned, and there was a marked asthmatic wheeze on expiration. Little air entered the right lower lobe of the lung. The radiographic plate was negative. The infant was bronchoscoped, a four mm. tube being used. In the right bronchus, as far downward as it could go, was seen a whitish mass which looked like a plaque of diphtheritic membrane. This was removed by suction, for fear of maceration with forceps. Both bronchi were then explored but no further pulpy masses found. The baby improved after the removal of the piece of paper and much secretion by suction but within a short time the lungs began to fill and there was difficulty in breathing. The four mm. tube was again introduced and much secretion evacuated. Marked subglottic stenosis was seen on the second introduction of the bronchoscope even though we had only worked fifteen minutes. We decided to perform tracheotomy for the subglottic stenosis and drainage of the lung. Tracheotomy was performed with the bronchoscope as a guide.

The tracheotomy temporarily relieved the condition, but pulmonary edema became very bothersome and repeated aspirations were made to remove secretion. This was easily accomplished by the introduction of a small catheter into the tracheotomy tube. Repeated aspirations continued each time that there was difficulty with respiration, but this was all to no purpose, for thirty-four hours after bronchoscopy the unfortunate infant succumbed to pulmonary edema.

CASE XII. This is a bronchoscopic gauze sponge which became detached from a sponge holder which was not fixed properly and became lodged in the right upper lobe bronchus. This accident occurred in an adult suffering from tracheobronchial diph-



FIG. 17.

FIG. 17.—Toilet paper removed from right lower lobe bronchus (Case XI).



FIG. 18.

FIG. 18.—Gauze sponge removed from right upper lobe bronchus (Case XII).



FIG. 19.

FIG. 19.—Upholsterer's tack removed from right stem bronchus (Case XIII).

theria after the removal of a diphtheritic cast. It was during the process of swabbing the tracheobronchi with antitoxin that the sponge was lost. The nurse, in applying the sponge, did not tighten the collar over the grasping blades of the sponge

holder and it was easily detached and lost. The sponge, readily absorbing the bloody secretion in the bronchus after the removal of the membrane, was difficult to locate. However, after a few minutes' search, it was located in the upper lobe orifice and was easily removed. The patient made a complete



FIG. 20.—Upholsterer's tack seen in right stem bronchus opposite the middle lobe orifice (Case XIII).

recovery from the diphtheritic foreign body and sponge.

CASE XIII. An upholsterer's tack removed from the right stem bronchus opposite the middle lobe orifice after a sojourn of two and a half years. I had the pleasure of seeing this patient, a boy of eight years, with Dr. Forbes. The tack was in a difficult location in the right stem bronchus, and the head was anchored at the middle lobe bronchus, imbedded in a firm stricture of long duration. The point of the tack could be easily seen through the seven mm. tube pointing well to the left. The head of the tack was not visible. Dr. Forbes had dilated the stricture several times but the tack could not be budged. I had the good fortune to be of assistance at two sittings and it was at the last trial that I was given the opportunity to remove the tack. The difficult problem presenting was, that the shaft and point of the tack were pointing well to the left, and that the head of the tack would be reanchored in the lip of the middle lobe bronchus each time an attempt was made to remove it against the axis of the presenting point. Therefore, the boy's body was rotated well to the left and the bronchoscope and forceps were brought into a line with the presenting shaft and point of the tack. Now axis traction was applied with considerable pull, and in one minute the bronchoscope, forceps and tack were all removed together. There was a lung abscess which ruptured into the pleura, and a rib was resected to drain the cavity. It was a long time after the removal of the foreign body before the drainage tube could be removed from the pleura. The boy recovered.

CASE XIV. Four pieces of raw carrot inhaled into the right and left bronchi in a child aged three. The

child had a croupy cough and violent asthmatic wheezing for five days, and had been treated as a case of diphtheria. As the asthmatic dyspnea did not improve after antitoxin, and as Dr. Raymond Laub had obtained a history from the mother that the child had a choking spell five days prior while eating raw carrot, the child was referred to me for bronchoscopic examination. On admission, the child was in *extremis* and made no effort to cough. There was a marked asthmatic wheezing expiration audible at some distance. Dr. Laub had made a physical examination of the chest, and stated that little air was entering either lung, and that the percussion note was tympanitic. There was a general subcutaneous emphysema present which involved the face, chest and trunk. The larynx was emphysematous and shiny. The trachea and bronchi were not involved. With a five mm. tube a piece of carrot was removed from the right main bronchus. The child was moribund and died shortly after the removal of the large piece of carrot. An autopsy was permitted by the parents and three smaller pieces of carrot were removed from the lung. One piece was found in the right superior lobe bronchus; the third piece in the left main bronchus, and the fourth piece in the dorsal branch of the left lower lobe bronchus, at which location there was a well defined abscess containing foul smelling pus. The lungs were beefily congested and ballooned with air. The visceral pleura was covered with air blebs from the size of a pea to a half dollar. The rupture of the blebs probably caused a leaking of air into the mediastinum, which followed the cervical fasciæ



FIG. 21.—Lateral view of upholsterer's tack in right stem bronchus (Case XIII).

and produced tissue emphysema. The heart was increased in size. This case illustrates the valve-like action of loosely placed foreign bodies in the air passages. It also illustrates that the irritating effect of raw carrot in the air passages is equally as irritating and fatal as the inhalation of peanut kernels, and was rapidly productive of food inhalation bronchitis and lung abscess within five days of the accident.

CASE XV. Peanut pulp of a parched nut removed from the right bronchus of a child two and a half years of age. The child had been given several pieces of peanut which had been partly broken up by the mother. The child aspirated it into her lung shortly after taking it into her mouth and had a

been a fatal peanut bronchitis and pulmonary abscess.

CASE XVI. Peanut kernel and several small pieces removed from the right bronchus of a child of three years and eight months. The child was admitted to the hospital five days after the accident. A



FIG. 22.

FIG. 22.—Four pieces of raw carrot removed from the bronchi of a child (Case XIV):



FIG. 23.

FIG. 23.—Peanut pulp removed from right bronchus (Case XV).

violent choking spell. The child was brought to the hospital six hours after the accident. The physical examination showed that little air was entering the right lung. There was an asthmatic expiratory wheeze. An x ray plate revealed a shadow over the right upper and middle lobes, but the radiographer thought there was also a shadow in the right lower bronchus. Bronchoscopy was performed without anesthesia and a small piece of peanut was removed from the right stem bronchus opposite the middle lobe orifice, a five mm. tube being used. As the piece removed by forceps seemed to be the largest piece, the remaining fragments were removed by suction through a two millimetre tube. The small pieces of pulp were readily removed by this method, care being taken not to wad the pulp in the lower lobe bronchus.

All of the peanut pulp was apparently removed for air entered the whole of the right lung. There was a high rise in temperature to 105.2°, following the removal, but gradually fell to normal within two days. The child was kept under observation for two weeks and then discharged after repeated stethoscopic examinations of the chest. The child made a complete recovery and was in perfect health six months after the extraction. This case illus-



FIG. 24.

FIG. 24.—Peanut kernel removed from right bronchus (Case XVI).

splendid radiograph taken showed a dense shadow over the right lobe. Bronchoscopic examination was made and a fragment removed from the right stem bronchus. By suction several small fragments were removed and about a dram of foul smelling pus evacuated from the lower lobe bronchus. After having worked for fifteen minutes the procedure was discontinued. There was considerable reaction following the bronchoscopic examination and the temperature rose to 104.2°. The pulse and respiration were rapid. A physical examination made at this time showed that there was a diffuse bronchitis and pneumonia over the lower lobe of the right lung. Posteriorly there was no air entering. Three days later a second bronchoscopic examination was made with a four mm. tube and the dorsal branch of the lower lobe bronchus explored. No fragments of peanut were removed, but some pus was evacuated. From this time on the child began to run a septic temperature. The left lower lobe was aspirated with a long needle and the abscess cavity located. Unfortunately a pulmonary abscess developed, owing to the failure to remove a small fragment which had entered a small dorsal branch bronchus. Later the abscess increased in size and a rib was resected. This drained the abscess but the child did not improve. She continued to linger



FIG. 25.—Fragments of meat removed from right bronchus (Case XVII).

trates the value of suction in removing small pieces of peanut from the lung. Had an attempt been made to remove all of the small fragments with forceps there would have been great danger of macerating them, and some of the tiny fragments would have been lost, and the result would have



FIG. 26.—Pieces of infectious material removed from right upper lobe bronchus (Case XVIII).

in this septic condition and succumbed six weeks later.

CASE XVII. Some fragments of meat removed from the right bronchus of a boy aged four. The boy was admitted to the Kingston Avenue Hospital for laryngeal diphtheria, for a dose of antitoxin

given by the family physician did not relieve the dyspnea. On admission, Dr. Adam Eberle, by a very careful physical examination, ruled out tracheo-bronchial diphtheria, and notified me of the possibility of a foreign body on account of the mother's statement that the child choked while at the table



FIG. 27.—X ray of peanut pulp in right bronchus (Case XV).

and developed croup the same night. The onset of the croupy attack was too sudden for diphtheria, and Dr. Eberle suspected that a foreign body in the right lung was the cause of the trouble. A bronchoscopic examination was made with a five mm. tube and a small mass of chewed meat was removed from the right bronchus. The physical signs did not clear up while the bronchoscope was *in situ*, and on a second inspection a small piece was removed from the lower lobe bronchus. The physical signs as elicited by the stethoscope immediately improved after the removal of the fragment, and air readily entered the lung. The boy was kept in the hospital for two weeks and discharged as cured. The interesting points of this case are the diagnosis of a foreign body by Dr. Eberle on a vague history and the stethoscopic signs in the chest. And second, that a stethoscope physical examination with the bronchoscope *in situ* is of the greatest aid in determining whether all of the foreign body has been removed.

CASE XVIII. Some small pieces of cheesy infectious material removed from the right upper lobe bronchus of a child of one year. The child was admitted to Riverside Hospital for supposed diphtheria. After the acute diphtheritic process had subsided there was a severe hacking cough and a peculiar wheeze on expiration. Dr. John Crawford suspected the presence of a foreign body and had an x ray picture made. The x ray showed a very dense shadow over the upper lobe of the right lung. Two days later we bronchoscoped the child and located a foreign body in the orifice of the right upper lobe bronchus. A whitish mass was seen in the orifice of the upper lobe bronchus through a four mm. tube. It was grasped with forceps and re-

moved. On its removal a small piece was seen to fall into the stem bronchus. The child was placed in an exaggerated Trendelenburg position and with a small suction tube this piece was removed. With the first piece removed there was a small sac which seemed to contain the particles. A few hours later subglottic edema developed, even though we had only worked ten minutes. The stenosis required intubation, a oneyear tube being worn for two days. One month later the child was discharged from the hospital cured. The specimen was sent to Dr. Jeffries of the Polyclinic Medical School Laboratory and he reported that the material was enclosed in an epithelial sac. "The material removed from the right bronchus of K. Z. was a mass of pus cells and mixed organisms, no tubercle bacilli were found. The mass is similar to the cheesy infectious material removed from the crypts of tonsils, and no doubt it fell from the tonsil into the lung." The child had hypertrophied tonsils with cheesy material in them when examined after the report from Dr. Jeffries. The small mass in its epithelial covering produced a complete blocking of the right upper lobe of the lung. Later x ray plates showed the lung to be clearing.

CASE XIX. A tracheobronchial diphtheritic cast removed from the right bronchus of a boy eight years of age. The boy had been ill with a mild bronchitis for six days and diphtheria was suspected by Dr. Brendler, who asked me to see the patient with him. A large dose of antitoxin had failed to relieve the croupy attack, which had become gradually worse twenty-four hours later. The child was *in extremis*, and expiration was difficult and accompanied by an asthmatic wheeze. A rapid stethoscopic examination showed that little air was entering the right lung. There were many noisy râles over both lungs. We bronchoscoped the boy and found the larynx congested. The lower tracheal and right bronchus were filled with membrane, which



FIG. 28.—X ray of peanut kernel in right bronchus (Case XVI).

was easily removed by suction. The trachea and bronchi were swabbed with antitoxin and a long intubation tube introduced. There was a very severe reaction following the removal of the membrane and the temperature gradually rose until it was 107° an hour later. It was evident at this time

that the boy was *in extremis* and would probably succumb. He was irritable and craved for water, which he could not swallow on account of the trickling into the tube. A small rubber catheter was introduced through his nose into the esophagus

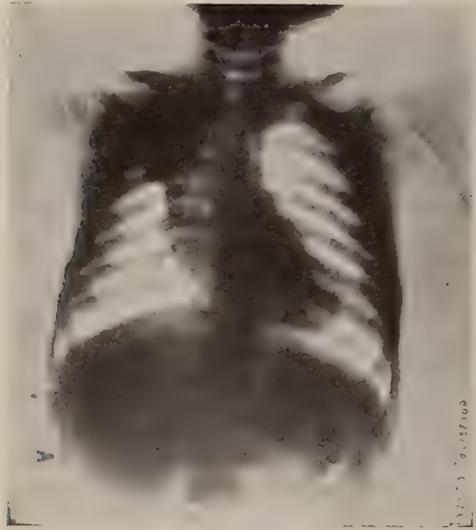


FIG. 29.—X ray showing dense shadow over upper lobe of right lung (Case XVIII).

and a half pint of milk with two drams of whiskey introduced. His thirst having been relieved the boy fell asleep. Within two hours his temperature had fallen to 105° and it continued to range between 105° and 103.2° for the next two days. Feeding was continued by gavage and as he was getting a good amount of nourishment he continued to improve. By the end of the fourth day the general condition of the boy had improved to such a degree that I decided to remove the long bronchial tube. This was done and there was no discomfort after its removal. Reintubation was not necessary. The boy had a protracted convalescence owing to a patchy pneumonia following, but he made a complete recovery after two months.

CASE XX. Membranous diphtheritic plaques removed from the trachea and bronchi. This case



FIG. 30.

FIG. 30.—Diphtheritic cast removed from right bronchus (Case XIX).



FIG. 31.

FIG. 31.—Diphtheritic plaques removed from trachea and bronchi (Case XX).

was seen with Dr. Ginsberg, of Yonkers, N. Y. The child had been intubated by Dr. Pisek who had given a large dose of antitoxin. The child was greatly improved after intubation of the larynx, but the same evening he became dyspneic in spite of the

tube, and I was called to bronchoscope the patient. In the meantime the tube had been coughed up and when I arrived the boy was in much distress. The bronchoscopic examination revealed a loose cast of membrane in the trachea. This was removed and a thin piece was visible in the right bronchus. After this was removed there was no further membrane visible. An intubation tube was introduced. The condition of the boy was much improved the following day and he was in sufficiently good condition to remove the tube on the third day. There was no further trouble after the removal of the tube and the patient made an uneventful recovery. The tube used was a five mm. and the time of operation six minutes.

ESOPHAGEAL FOREIGN BODIES.

CASE I. Codfish bone imbedded in the plicacricopharyngeus with only the small beaded head of the articulating end presenting. Referred by Dr. H. T.



FIG. 33.



FIG. 34.



FIG. 35.



FIG. 36.



FIG. 37.



FIG. 38.



FIG. 39.



FIG. 40.



FIG. 41.

FIG. 33.—Codfish bone (Case I).

FIG. 34.—Chicken bone removed from esophagus (Case II).

FIG. 35.—Chicken bone from esophagus (Case III).

FIGS. 37 to 41.—Diameters of coins removed (Cases IV to IX).

Galpin. Radiographic plate negative. Great pain from spasmodic contraction of cricopharyngeus, and much gagging and discomfort. Beaded end presenting in area of inflammation. Easily removed through spatula esophagoscope in one minute; no anesthesia; recovery.

CASE II. Clinical case in child of four years. Small piece of the breast bone of a chicken, presenting crosswise and transfixing in upper thoracic esophagus for five days; marked edema. Radiographic plate did not show bone. Easily removed through seven m.m. esophagoscope in a few seconds after turning to avoid cutting esophageal wall.

CASE III. Piece of breast bone of chicken in esophagus of a child of ten years; in esophagus three days; below cricopharyngeus. Easily removed through esophagoscope in two minutes; no anesthesia.

CASE IV. American penny in esophagus of a child of one year. It was lodged in the esophagus below



FIG. 32.—Penny in esophagus (Case IV).

cricopharyngeus for a week. The esophagus was lacerated and swollen from two attempts to remove before admission. A spatula esophagoscope and alligator forceps was used; extraction in eight minutes. It was difficult to locate on account of marked edema and sloughs in esophagus; extraction followed by cure. There was no stricture of esophagus six months later.

CASE V. Coin, penny, in esophagus of child two years; in esophagus fourteen hours; easily extracted in one minute; cure.

CASE VI. Referred by Dr. Angelo Smith. Coin, nickel, in esophagus of child two and a half years, upper thoracic region for eight days; much edema covering coin; extraction, cure. Removed in four minutes. Tube, seven mm. bronchoscope.

CASE VII. Coin, nickel, in esophagus of a child of three years and eight months; in esophagus four weeks; opposite bronchial crossing after having been thought to have been shoved down with a stomach tube; extraction, cure. Esophagoscope. Time, ten minutes.

CASE VIII. Coin, nickel, in esophagus of a child two and a half years; in esophagus twelve days; edema covering whole of presenting edge; extraction through tube spatula with alligator in six minutes.

CASE IX. Coin, nickel, in esophagus of an infant of one and a half years; in upper esophagus two days; difficulty in breathing and swallowing; extraction through laryngeal spatula with alligator forceps in one minute.

CASE X. Coin, quarter of a dollar, in esophagus of a child of three years for fourteen days. There was a marked edema; esophagus covered with thick

exudate; no history of any attempted removal before admission; pharyngeal wall much inflamed; membrane removed was diphtheritic by culture. The foreign body was completely hidden from view in membrane and edema. The extraction was difficult owing to edema, which was difficult to push aside to see coin. The esophagoscope and long alligator forceps were used after the edema over the coin was separated with blades of forceps. Time of operation, seven minutes. Recovery.

CASE XI. Triangular piece of sternum of chicken in esophagus below plicacricopharyngeus of a young lady of sixteen years for twenty hours. The patient was referred to me by Dr. Ard of Plainfield, N. J. Easy removal in three minutes with spatula esophagoscope and alligator forceps.

CASE XII. Large triangular piece of the sternum of a chicken in esophagus below cricopharyngeus of a woman of thirty years for two days. Good x-ray plate of triangular piece of bone. Referred by Dr. Angelo Smith, of Yonkers, N. Y. Points deeply imbedded in esophagus with some bleeding at fixation of points; spatula esophagoscope; rotated to disengage points to prevent laceration; extraction, cure. Time of operation, four minutes.

CASE XIII. Mother of pearl button in upper thoracic esophagus in a girl of six years for forty-six hours. Easy extraction through seven mm. esophagoscope in two minutes. No anesthesia. Recovery.

CASE XIV. Large mother of pearl button in esophagus of a girl of ten years for five days. Referred by Dr. Angelo Smith. Radiographic plate showed



FIG. 42.—Quarter dollar in esophagus (Case X).

button below bronchial crossing. Patient had been fed by force and efforts had been made to push the button down. There had also been several emetics administered by the parents with the hope of bringing it up or sending it down. No new x ray picture taken just before esophagoscopy. A seven millimetre esophagoscope showed a curdled mass below the bronchial crossing, but no button was seen. X rays were then taken of the stomach and intes-

tines, but no button was located. The curdled mass seen in the esophagus was the remains of the dissolved button, the button having been dissolved by the frequent emesis of hydrochloric acid. At the suggestion of Dr. Goldhorn, a similar button was



FIG. 43.—Chicken bone in esophagus (Case XII).

removed from her coat and immersed in a very dilute solution of hydrochloric acid. The button became a cheesy mass within twenty-four hours. It is interesting to note that these buttons, so often called mother of pearl, are made of compressed casein and are readily dissolved in dilute hydrochloric acid. Had an x ray plate been made just prior to the esophagoscopic examination the opera-



FIG. 44.—Pearl button in esophagus (Case XIII).

tion would never have been attempted, for no foreign body shadow would have been seen. However, on the other hand, failure to find nothing but the cheesy mass of the button taught us what these buttons were made of.

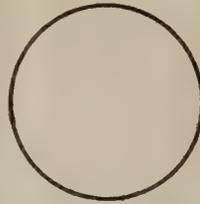


FIG. 45.



FIG. 46.

FIG. 45.—Diameter of quarter removed from esophagus (Case X).
FIG. 46.—Chicken bone removed from esophagus (Case XI).



FIG. 47.

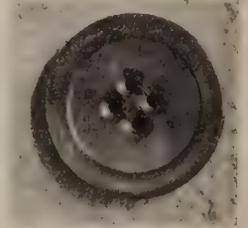


FIG. 48.

FIG. 47.—Chicken bone removed from esophagus (Case XII).
FIG. 48.—Pearl button removed from esophagus (Case XIII).



FIG. 49.



FIG. 50.

FIG. 49.—Lead skirt weight removed from esophagus (Case XV).
FIG. 50.—Apricot seed removed from esophagus (Case XVI).

CASE XV. A lead skirt weight in esophagus of a boy of six years. In esophagus, below cricopharynx, for four days. Extraction by spatula esophagoscope in two minutes.

CASE XVI. Apricot seed held firmly in crico-



FIG. 51.—Olive bougie in gastrototic stomach (Case XVII).

pharyngeus in a man of sixty-two years. In esophagus five hours. Much pain and gagging and difficulty in breathing. Extraction through spatula esophagoscope with Jackson's safety pin closer in five minutes. The head was held well over end of table for fear that the relaxation of the spasm of the cricopharyngeus would release the foreign body.

CASE XVII. Olive pointed bougie and staff accidentally broken off while a gastroenterologist was attempting to dilate a stricture blindly. Case referred by Dr. Wolff Freudenthal. The patient was an extremely emaciated woman of forty-three years. Bougie in esophagus forty-six hours. Much laceration of upper esophagus from attempted extraction before admission. Olive by x rays in gastrostotic stomach in pelvis. Metal of staff opposite and below bronchial crossing. A ten mm. esophagoscope was used and the presenting metal part of staff grasped by long alligator forceps. Extraction in three minutes. The bulbous end was not held in a stricture on removal.

FAILURES AND DEATHS

Out of this series of foreign body extractions there has been one failure to remove the foreign body at the first trial, and three deaths. The failure was an attempted extraction of a deeply-located shawl pin in the dorsal branch of the right lower lobe bronchus, the point having penetrated through the bronchial wall of the opposite side. The point was disengaged and an attempt was made to remove the intruder, which now seemed to be extremely easy. The point and shaft of the pin were brought outward through the bifurcation, while the head of the pin, which caught on the opposite bronchial wall, held it firmly, and this caused the forceps to slip its hold. The writer had worked only a short time, but as the pin was now placed in an extremely difficult position, further attempts were not made, as it was decided then that new x ray plates were advisable to determine the changed position before another attempt was made. The second trial for me, however, was not forthcoming, as Dr. Jackson was consulted in the meantime, and the pin successfully extracted by him one week later. The patient suffered no discomfort other than the mental anxiety of knowing that the pin was still in the lung. The temperature and pulse remained normal throughout the week before the successful removal.

Of the three deaths, two occurred shortly after bronchoscopy. One was moribund on admission

and would have died shortly with or without examination, and the other, an infant, had pulmonary edema at the time of the bronchoscopic examination, which continued up to the time of her death. The third death was due to the retention of a piece of peanut kernel, which caused septic bronchitis and pulmonary abscess, and death ensued six weeks later. General anesthesia was not used for any of the extractions. Cocaine, ten per cent., was used for the bronchoscopic examinations in adults, and no anesthesia for the esophagoscopic in children.

The patients with the two diphtheritic foreign bodies included in this series recovered, but one of them had a stormy time. In a former series of diphtheritic foreign bodies reported, all of the cases without complications recovered. Pneumothorax occurred in one very difficult extraction after the report of this series and is therefore not included, but will be reported later in another series.

ACUTE INFECTIONS OF THE HAND AND THEIR SURGICAL TREATMENT.

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The general practitioner is seldom called upon to treat a condition which can give him more annoyance than an infected hand, nor one whose treatment is fraught with greater difficulty; and perhaps no subject in the whole field of surgery has been more neglected by the surgeon. Even though the results may be the best obtainable, they are never satisfactory from the viewpoint of the patient, who expects *restitutio ad integrum*, and that in much less time than is always required; while the compensation to the surgeon, for his efforts and skill in preserving through a tedious course of treatment a useful though often a somewhat disabled hand or finger, is always more grudgingly allowed than would be that for the total removal of the same part followed by a quick recovery.

The neglect of this subject by the general surgeon probably arises from the fact that few of these cases are referred to him, and, like other people, surgeons prefer to talk, teach, or write about that which comes most often under their special care. In our schools the teaching of the surgery of the hand consists in *telling* the student how to perform amputations, or reduce fractures or dislocations, while the topic of how to deal with hand infections, which, by the way, are more frequent than all three former conditions put together, is hurriedly passed over, or, if dealt with at all, is wrongly taught. If you doubt it, just ask yourself if you were not taught that through and through drainage was the best way to deal with palmar phlegmon?

A knowledge of the gross anatomy of the hand is a *sine qua non* to the intelligently successful treatment of any infection in finger, hand or forearm, and I would like to call attention to it briefly by means of the diagrams herewith shown.

The most common site for the entry of infection is the distal phalanx, and Fig. 1 shows a diagram sketched from a section through any distal phalanx



FIG. 52.—Olive pointed bougie from esophagus (Case XVII).

close to the proximal end of the nail. In the centre note the bone covered tightly everywhere (except under the nail and over its articular surface), with periosteum. Under the nail, filling up the interval between it and the bone and strongly adherent to both, is a fibrous layer—the matrix of the nail.

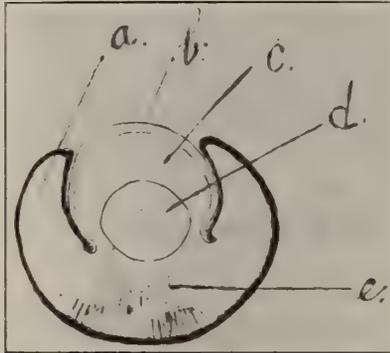


FIG. 1.—Diagram of cross section through distal phalanx; a, fold of nail; b, nail; c, matrix of nail; d, bone covered with periosteum; e, fibrous trabeculae of pulp reaching from periosteum to skin.

This layer has very slight resistance to infection and, once infected, there is no room for the inflammatory exudate to be thrown out. Even very slight inflammatory reaction produces such pressure between bone and nail that the blood supply at the point is cut off or diminished and spread of the infection ensues. This is why infections of the matrix of the nail are so slow in getting well.

I remember a strong, healthy young man, whose thumb nail, partly undermined with pus, had been treated for a period of nine weeks, and then, as he expressed it, "was worse than ever." He had been accused of syphilis but his Wassermann reaction was negative, and his thumb got well without any antiluetic treatment in about eight or ten days when he was treated surgically. The quickest and best way to deal with an infected matrix is to remove that portion of the nail overlying the infected area—wide removal so that there will be no overhanging edges—and apply a moist, mild antiseptic or normal saline dressing. Keep the part at rest and change the dressings often. Never allow a dressing to become dry before healing begins, and thereafter it is better to use an ointment.

In Fig. 1 notice how the soft parts roll up over the sides of the nail; Fig. 2 shows a longitudinal section through the same phalanx. In this figure note the fold of soft parts—skin and subcutaneous tissue carried forward over the back of the nail. This fold over the back and along the sides of the nail is perhaps the most commonly infected part of the finger, this tissue being much exposed to injury. The bacteria get into the injured tissue and suppuration on the deep aspect of the fold ensues, for here they find moisture, warmth and darkness, while injured tissue makes for them a good culture medium. It is but a short distance around the root or side of the nail to the matrix, and if this becomes infected the overlying part of the nail must come off.

For the ordinary slight infections hardly more than a splint and alcohol pack are needed. If, however, the condition does not yield to such measures the fold should be cut through at once. It is worth

doing under anesthesia. It can be properly done only when the patient feels no pain. Cut through the fold backward from its free edge on each side until the incision reaches back as far as the root of the nail extends. That is nearly half way from the edge of the fold to the joint. One must be careful not to open the joint, Fig. 3. The fold thus incised can now be turned back as a flap. The underlying nail root is examined to make sure that the matrix under it is not infected. Pus under the nail looks yellowish white. If there is pus under it remove the nail widely; then lay a thin bit of rubber or lint in the wound and replace the flap. Apply a mild antiseptic wet dressing and put the part on a splint and the arm in a sling. Change the dressing frequently and keep immobilized until well.

In Figs. 1 and 2, notice the so-called pulp of the finger. Observe the lines stretching from periosteum to skin. They represent dense, tough fibrous bands or partitions. These divide the space between skin and bone into innumerable chambers and each chamber is filled with fat. Were it not for these partitions, at every grasp sensitive nerve endings would be painfully pressed between skin and bone, for the fat, being fluid at body temperature, would flow to one side of the point pressed upon. But these same fibres prevent the skin from being pushed away from the bone when exudation occurs between the two. When for any reason, therefore, an inflammation occurs here, it is not long until the pressure against the skin on the one hand and against the periosteum on the other, becomes sufficient to imperil the vitality of one or both, and also that of the parts intervening. In such a circumstance the fat and the fascia are always the first to suffer. Always offering poor resistance to infection, when thus injured they now favor the growth of bacteria and a bad condition becomes worse.

For infection in the pulp the alert physician never waits for the pointing of suppuration. An early and free incision, not only through the skin but down through the pulp, with proper dressing and fixation, will check the spread of the trouble. Incision relieves the tension, and it is the tension which causes death of the periosteum, the skin, the bone, and of all the intervening tissues, for the tension soon shuts off the blood supply.

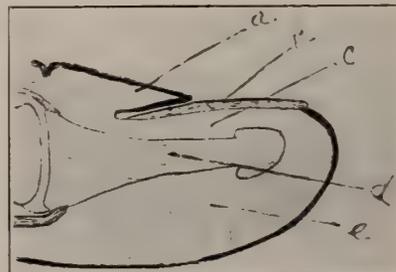


FIG. 2.—Diagram of longitudinal section through middle of distal phalanx; lettering is the same as in Fig. 1.

I have called attention to the periosteum, saying that it was firmly adherent to the bone except over its articular surface. Exposed to trauma as the distal phalanx is, and separated only such a short distance from the surface as its periosteum is, it is not surprising that the periosteum is itself often

injured. When injured, blood or serum collects under it, as all have seen it collect under the nail at the site of trauma, and such small extravasation is often a focus for the development of bacteria lodged here by the blood stream.

When bacteria reach such a site the result will

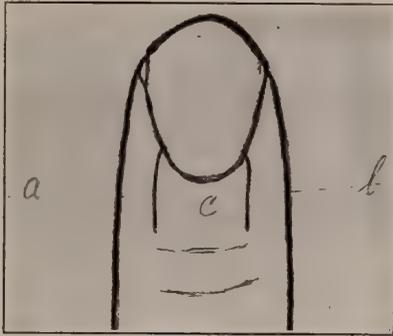


FIG. 3.—a and b, incision through the inflamed fold of nail; c, flap to be turned back to expose root of nail.

most probably be an abscess under the periosteum. The signs are unmistakable. The patient complains of severe pain in the finger, which is constant, throbbing and almost unbearable; pus is about to form, or has already done so, under the periosteum. The periosteum does not readily stretch in any direction, but it yields a little in all directions around the pus and soon the pus has lifted it up from the bone over a considerable area. The pus may pass completely around the bone, and spreading backward when it reaches the end of the periosteum at the edge of the articular cartilage, it may break into the joint. But before it has done this, or afterward, it may break through the periosteum into the subcutaneous space—into the pulp. Whenever the pus escapes from the periosteal covering, then the throbbing pain is instantly relieved. The patient will have pain later on but for a while there is relief, and when the pain recurs, which it does when the subcutaneous tension increases, it is not so severe as it was at first. A strange thing is, that at the onset of any subperiosteal suppuration, while the patient is complaining so bitterly of the pain, there is very little swelling of the part or perhaps none whatever. In fact, there is little swelling before the periosteum bursts.

Careful examination will always reveal a point of maximum tenderness, which is to be found by pressing gently on the skin with a toothpick or some such pointed object. The patient can often locate this spot very accurately. This tender point exists very early in the disease before the infection has spread far or broken through the periosteum. Under the tenderest point between the periosteum and the bone is the seat of the trouble. Over this point is the place to open, and the knife point should reach the bone here only. A large incision is never needed if one can get the patient early. Often only a very small drop of pus is found. The process usually lasts two or three days before the periosteum gives way.

Knowing the pathology, course, and prognosis of infections, no sane man would counsel any other than surgical treatment; yet, those who do not know

advocate poulticing until the felon—for this is a real felon—is "ripe."

The offending organisms in hand infections are usually the staphylococcus and the streptococcus, and the pus is very thick and does not run out easily. Saline in which citrate of soda has been dissolved, two drams to a pint, helps to thin the pus. So does Dakin's solution. Dress with gauze moistened in such a solution, change often, and keep the part at rest. Instead of the moist dressing, constant immersion in a hot bath of saline and citrate is often better. We use the latter during the day and the warm, wet pack at night.

When infection following wounds in the skin or subcutaneous tissue spreads, it does so most often by way of the lymphatics. There are lymphatic vessels passing along the sides of the fingers. Their radicles are in the deeper layers of the skin, the subcutaneous tissue, and in the periosteum and bone. But in addition there are what are known as lymph spaces; for example, what are called perifascial lymph spaces exist between the subcutaneous fat and the deep fascia or tendon sheaths, and there are perivascular lymph spaces around the vessels on each side of the finger. If now, for any reason, a lymph space becomes infected, the pus can easily spread in any direction until the whole space is involved. This explains how it happens that pus may extend completely around a finger and not affect the tendon sheaths or periosteum at all. It is a point to remember in opening phlegmons of the fingers; for if one cut deeper than the plane where he encounters the pus, and if the incision is over a tendon sheath, he may cut through the fibrous tendon sheath and unnecessarily open its synovial lining. This, too, may follow the insertion of a drain or pack, the pressure of the same causing necrosis of the tendon sheath. The ordinary lymphatic vessels passing down the sides of the fingers converge in the web, unite, and crossing the web, enter the palm or pass to the back of the hand. Great numbers of them eventually reach the back of the hand. This, as well as the loose nature of the subcutaneous tissue there, explains why it is



FIG. 4.—Shows the web in first space cut across to open a web abscess.

that the back of a hand undergoes such great swelling in all these infections. It is simple, lymphatic edema. Very seldom does pus so spread, but the web between the fingers is the place to look for the first metastatic abscess in finger infections. Bacteria—not pus—get into the lymph channels and

flowing back reach the web. The web is filled with fat. Fat is poorly supplied with blood, its resistance being low. This fat is no exception to the rule and the bacteria find a good place to grow, just as they do when crossing the ischio-rectal fossa through the lymphatics there. An abscess develops in the

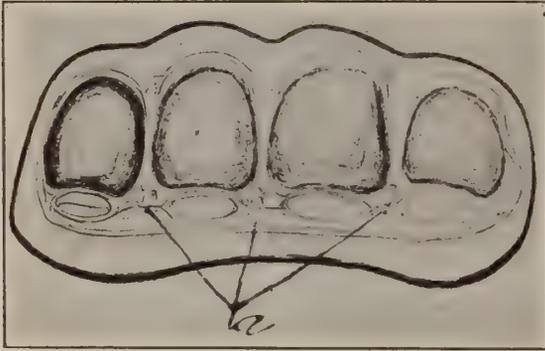


FIG. 5.—Diagram of cross section of hand through web of finger; a, tendons of lumbricals and interossei.

web. Treated in time, nothing serious will happen; but delay is dangerous, for this little abscess in the web can, in a few days, extend directly into the palm, and while recovery is to be expected, the hand will never be as good as it formerly was, once it has suffered from a deep palmar abscess.

At the beginning, metastatic abscess in the web is not very painful. There is plenty of room for the exudate; therefore the pressure is not great at first. At the same time, the pain at the original site of infection is great and distracts the patient's attention. If the diagnosis of metastatic abscess is not made before the patient directs attention to it, it is too late to prevent him from having a deep palmar abscess. How then shall we make the diagnosis? First, by being aware of the fact that here is the first site for the development of a metastatic abscess, and that metastatic abscesses may develop here in any kind of finger infection, but most often in those of the skin and subcutaneous tissues; and secondly, by looking for the abscess in the web. Pain on pressure over the web is a sign that infection is present. One may elicit tenderness deep in the web within a few hours after the infection begins there, and when first the diagnosis is made is the time to treat the condition. Never wait for that sign which even fools may read—fluctuation. Remember that to delay, means to provoke a palmar abscess.

Fig. 4 illustrates the proper way to open a web. Cut straight through it for at least half an inch from its free edge, and if pus is not found, open bluntly through the fat in the middle of the incision still further toward the palm. If one cuts back farther than the point where the pus is, he will carry the infection into the palm. Insert a thin bit of rubber to keep the wound edges from agglutinating and dress the fingers wide apart. Immobilize the whole hand and forearm and immerse all in a hot bath as before. Do not practise changing the drains daily and never pack a wound in which there is virulent or viscid pus. The web abscess in any of the three inner spaces spreads by direct continuity into the fat of the palmar pad and thus an infection

of any one web may lead to infection of all the others. I have often seen this happen.

Now how does the web abscess become a palmar abscess? The lumbrical muscles are found deep in the palm. Springing from the tendons of the deep finger flexors, they run downward and pass to the radial side of the base of the corresponding finger; going through the base of the web, they insert into the tendon found lying on the back of the first phalanx—the common extensor of the fingers. The tendons of the interossei do almost the same. Thus the fat of the web comes into actual contact with these tendons. Each tendon is surrounded with loose areolar tissue—a lymph space—and so it is easy for pus, having once come into direct contact with a tendon to dissect its way along it.

Infection (metastatic) of the web of the first space is in a class by itself, inasmuch as it is nearly always intermuscular from the beginning. It follows infection of either thumb or index finger and can occur by direct extension of pus along perifascial lymph spaces, or by the ordinary lymphatic route to the base of thumb or index, and then along muscle tendons into the intermuscular space between the first dorsal interosseus muscle and the adductors of the thumb. As before, tenderness on deep pressure is the sign to watch for, and the space should be opened as soon as that sign appears. Fig. 4 shows the incision directly across the web. It continues through the superficial and deep fasciæ until the edges of the muscles are seen. The lines of their fibres cross each other *x* wise. The space between the two is found and opened by blunt dissection. The pus is there. A drain is inserted to the bottom of the abscess cavity and fastened there. The whole hand and forearm are immobilized with thumb and index slightly separated.

An abscess in this web can readily become a palmar abscess by dissecting its way around the edge of the adductors of the thumb, or along the palmar arch, or it can spread easily to the wrist along the synovial sheath of the flexor longus pollicis. In dealing with abscess in this web, no muscle

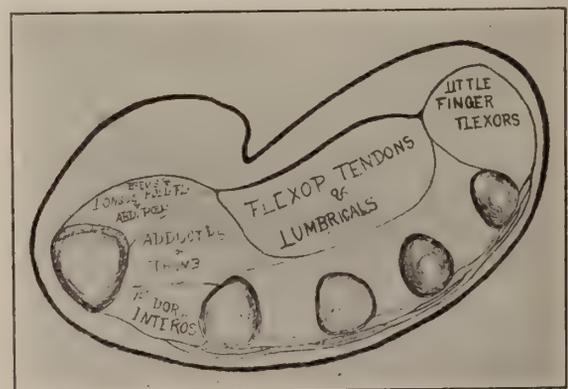


FIG. 6.—Diagram of cross section of hand through proximal half of palm to show compartments.

is cut. Through and through drainage is never used.

We shall briefly consider abscess in the palm. You are told of three compartments. The partitions between the compartments are none of them strong, and pus may pass from any one compart-

ment to any other, for the partitions fail as the bases of the phalanges are approached. The partitions are of fascia and are backward extensions of the deep palmar fascia. The outer compartment lodges the thumb muscles, the inner one the flexor tendons and short muscles of the little finger, while in the middle we have the flexor tendons and lumbricals of the middle fingers, together with vessels and nerves. Tendons and muscles must be surrounded with loose areolar tissue, or they will work but stiffly, and infective material spreads readily through loose areolar tissue. The deep palmar fascia is strongest over the middle compartment, and over all compartments the deep palmar fascia thins out, becomes cribriform, and finally fails entirely as we proceed distally. It disappears first in the interdigital spaces, leaving the digital vessels



FIG. 7. Palmar fascia. (Gray's Anatomy, p. 488.)

and nerves uncovered by it as they enter the webs of the fingers.

Here the superficial fat of palm and web becomes continuous with fat and areolar tissue under the deep palmar fascia. One can thus see how readily a primary superficial abscess can become a deep palmar abscess by direct extension, because the fascia forming the roofs of the palmar compartments is so strong and unyielding, and abscess in any of the compartments may spread well up into the wrist or forearm along the tendons or into its neighboring compartment long before it points on the surface of the palm. The swelling in the palm is for the same reason never marked until the abscess is well advanced.

Swelling on the back of the hand is always marked, but this swelling alone should not induce one to incise the dorsum. It is nearly always lymphedema, because as before mentioned the lymphatics drain toward the dorsum, but pus does sometimes collect here in the perifascial lymph space, and here as elsewhere localized deep tenderness is an early and never failing sign. The tender spot should be opened as soon as found. To "squeeze out" the pus is the most primitive surgery.

How to open a palmar abscess is a real problem

and whether to incise vertically or transversely is a moot question. A transverse incision will remain open better while the fingers are extended, and the fingers should always be dressed in extension, but a transverse incision in the lower part of the palm exposes the digital vessels and nerves to danger, while a vertical one higher up imperils the palmar arch. The patient should be anesthetized and an Esmarch bandage applied. One cannot use an Esmarch bandage to advantage unless the patient is anesthetized; hence the need for a general anesthetic and, besides, a local anesthetic in an inflamed area is not often successful. We use the ether rausch or ethyl chloride for such operations.¹ Use whichever incision you prefer, but identify the structures before you cut them. Cut down to the deep fascia and proceed with caution. Divide the deep fascia and then lay down the knife. If you have opened over the spot most tender on deep pressure, go straight on with blunt dissection until the pus appears. Do not pack, but insert soft rubber and fasten it in the wound. Any drainage material that presses on a tendon with any force for even a few hours, may cause local death of the latter. If a tendon or part of one dies, it takes four to six weeks to separate and come away. Immobilize fingers, hand and wrist, keep fingers in extension, and use the hot bath or moist dressing.

Every student remembers the synovial sheaths of the flexor tendons. He knows that there is around each set of flexor tendons, as they lie on the phalanges, a strong fibrous tunnel through which they run and which holds them to the bones. But inside this fibrous tunnel is a synovial bursa, as it were, which surrounds each set of tendons. These synovial investments extend farther up into the palm than do the fibrous sheaths: those for the index, medius, and annularis extending up to the middle of the palm, while those for the thumb and little finger reach right up to join the bursa under the anterior annular ligament. When pus is found in any of these synovial sheaths, that sheath is to be laid wide open over the place where the pus is, and for at least one to two centimetres above and below this. When the tendon sheath is involved, any attempt to move the tendon causes pain, and there is local tenderness over it.

When pus has invaded the great bursa at the wrist, the anterior annular ligament is cut through and the hand and fingers dressed in hyperextension and left so until healing is well advanced.

When the hot bath is used, the part must be kept on the splint while in the bath, and the solution should be as hot as can be borne without blistering. On no account should the temperature of the bath fall below 110° F. In weak patients it is not well to continue the bath day and night, because of fatiguing the patient; therefore during sleeping hours the part, still on the splint, is placed in large, hot packs wrung out of the solution and wrapped in waterproof cover, and the whole surrounded with hot water bags which are frequently renewed.

If an infection of the palm is properly opened and treated as outlined above, the progress of the

¹In my service ethyl chloride has been much used as a general anesthetic for short operations since 1915.

disease is quickly checked. The drains are removed in from three to ten days and the wound kept open so that pus cannot be retained and burrow. Active motion is encouraged for a few minutes at a time two or three times daily as soon as the drains are removed and gradually these periods of activity are increased and lengthened. Only those too long immobilized or improperly handled fail to regain useful function.

405-413 UNIVERSITY CLUB BUILDING.

THE X RAY AS AN ESSENTIAL GUIDE FOR PRODUCING ARTIFICIAL PNEUMOTHORAX IN ADVANCED CASES OF PULMONARY TUBERCULOSIS *

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The purpose of this article is to show the advantages of the use of the x ray in the control of the production of an artificial pneumothorax in advanced cases of pulmonary tuberculosis; and to demonstrate the necessity of a careful study of such cases before attempt is made to produce this condition.

In advanced cases of pulmonary tuberculosis, the almost constant harassing cough and frequent hemorrhages are the most difficult symptoms to treat.

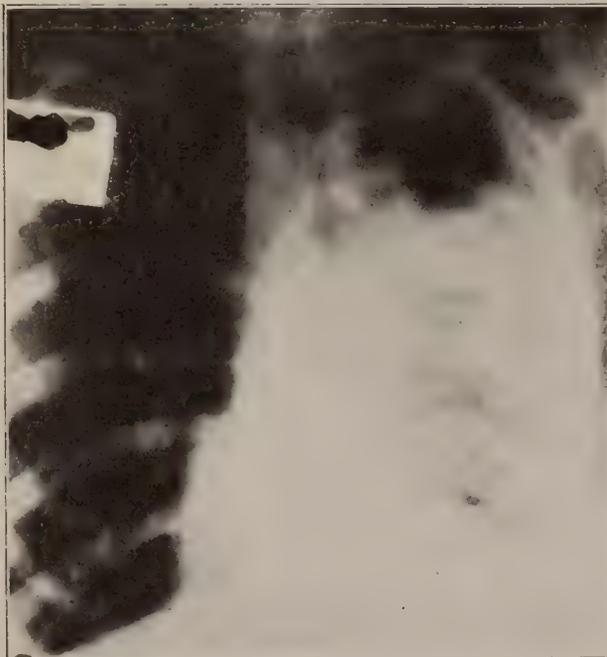


FIG. 1.—Condition of lungs prior to injections of air (Case I).

Narcotics and other methods are used to give relief, which is only temporary. With the production of an artificial pneumothorax, the affected lung is collapsed and the annoying symptoms are more or less permanently relieved; certainly to a more marked

extent than by the use of narcotics, and without their undesirable depressing effects. The purpose of the pneumothorax in these cases is not to produce a cure, primarily, but to render the patient's life more comfortable and possibly increase his chances for recovery. This relief from the harassing cough

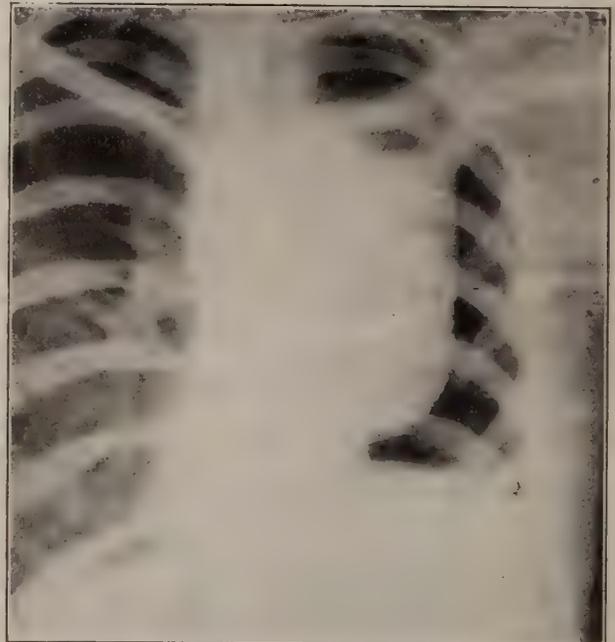


FIG. 2.—Condition of lung after injections of air (Case I).

and pain will also have a favorable effect upon the morale of the patient, which is a matter of great importance in the treatment of pulmonary tuberculosis. The relief of his sufferings is what we strive for. In certain seemingly hopeless cases, this treatment has caused an apparent arrestment of the disease in three selected cases cited in this article. Two of the advanced cases became ambulatory, after the patients had been bedridden for almost a year. They have shown a great amount of improvement.

There are several important factors to be considered before a pneumothorax is tried, and the x ray stands out as the essential guide to the clinician. I must not omit the aid of the fluoroscope, which is also part of the guide. With the bedside unit, the hand fluoroscope is used to great advantage. The x ray plates give the pathological findings as a permanent record, while the fluoroscope gives a clue as to the mobility of the chest and the excursion of the diaphragm of the affected side. The following points were studied before pneumothorax was produced: 1. The extent of the pathology, especially as to cavities. 2. Will the opposite lung be able to furnish sufficient pulmonary tissue after the affected lung has been collapsed without throwing additional risk to the patient? 3. Pleurisy and adhesions.

1. In the extent of the pathological involvement of the lungs, the x ray stands out as the positive guide. Cavities will always show on the x ray plate, whereas they may be missed by the most thorough physical examination (without entering into a discussion of the relative merits of the physical examination); and in deciding the extent of the

*Published by permission of the Surgeon General of the U. S. Army. Now on duty at U. S. A. General Hospital No. 19, Oteen, N. C., June, 1920.

involvement, I think it has been found that the röntgenological studies are the final and deciding factor.

2. The question of the opposite lung being able to furnish sufficient pulmonary tissue to functionate after the affected lung has been collapsed, is a serious problem to determine. In a case where one



FIG. 3.—X ray of lung prior to injection of air (Case II).

lung is involved and the other lung normal, there is no question, of course, that this is the ideal treatment. But it is in those cases where both lungs are heavily involved, and perhaps one somewhat less than the other, that the difficulty arises. A careful study of such cases is necessary, before any attempt is made to collapse the lung. Now, what is the course to follow when such is the case and the patient needs relief from his sufferings? In all probability this patient is going to die. Therefore we must be governed by the following factors, namely: the cessation of the cough, with a less copious expectoration; control of the hemorrhages and lessening the toxemia, which outweighs the risk we take in throwing additional burden on the small amount of uninvolved lung tissue remaining.

3. Adhesions and fibrinous pleurisy associated with a pulmonary tuberculosis, as seen by the x ray plate, is another factor to be thoroughly considered, for one cannot attempt to collapse a lung that is firmly plastered to the parietal pleura.

Of the 453 x ray examinations made in the last three months, forty-six were bedside examinations. I also made use of the hand fluoroscope. The remaining cases were examined stereoscopically. With this large number of cases to choose from for the production of an artificial pneumothorax, the problem was less difficult. Of the three selected cases, which I have followed by a series study of x ray plates, the results obtained are here noted and illustrations given. The cases were given up as hopeless. Two of the patients were bedridden for almost a year and now they are walking about the hospital

grounds to a limited extent. The third patient was the worst of the three, because both lungs were heavily involved in addition to the cavities in both upper lobes. By a study of these cases, with the x ray plates and the fluoroscope, an excellent guide is given to the clinician for the procedure of an artificial pneumothorax.

CASE I. Cadet H., admitted to the hospital on December 18, 1918, with a diagnosis of pulmonary tuberculosis, chronic, active, of the entire right lung; sputum positive; the left lung was apparently healthy. On October 20, 1919, the first introduction of air was begun. Fig. 1 shows the lung condition prior, and Fig. 2 shows the lung after numerous injections of air. This lung shows a few bands of fibrous tissue holding the upper part of the lung from complete collapse. On January 8, 1920, this patient had 200 C. C. of fluid removed from the base of the affected chest. He is now able to walk around after being in bed for about a year. The number of hemorrhages have been markedly reduced; the cough and expectoration have moderated greatly. In this case a tuberculous laryngitis seems to be developing, which may account for the patient in Case II being in a better physical condition although the lung is collapsed to a lesser extent.

CASE II. Colonel M.—, admitted to the hospital on June 18, 1918, with a diagnosis of pulmonary tuberculosis, chronic, active, of the entire left lung. He had been in bed for over a year and had numerous hemorrhages. In September, 1919, the first injection was given. Since that time the



FIG. 4.—Condition of lung after injection of air (Case II).

injections of air have been very frequent. Fig. 3 shows the lung prior to, and Fig. 4 shows the lung after the production of pneumothorax. For the last set of x ray plates, this patient was able to walk to the laboratory unaided, a distance of 600 feet, and also able to walk up and down a flight of stairs.

He has shown remarkable physical improvement, and has not had a hemorrhage in the last three months. Sputum is still positive.

CASE III. Private B.—, admitted to the hospital on September 22, 1919, with a diagnosis of pulmonary tuberculosis, chronic, active, all lobes, both lungs; sputum positive. On December 22,

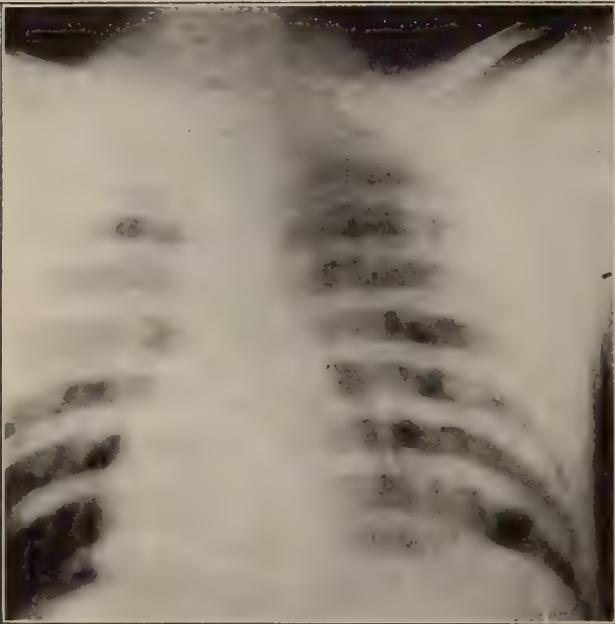


FIG. 5.—Lung prior to injection of air (Case III).

1919, he went on a furlough and had several severe hemorrhages. He returned to the hospital in a serious condition. On March 15, 1920, the following general report was made of his condition: Patient in bed with a temperature of 100.6°; general condition, unfavorable; cough, severe; expectoration, copious. He had several hemorrhages in the week prior to this report and it was then that the first injection of air was made to stop the hemorrhages. The right chest received 400 c.c. of air when a positive pressure was reached. It was seen by the first injection of air that the hemorrhages were stopped and he received further injections of air about once a week to keep the pressure on the inside of the right chest positive. The amount necessary would vary from two to four hundred c.c. The result of the pneumothorax was successful, as the hemorrhage ceased and the expectoration was less copious and coughing controlled to a great extent. The x ray findings were as follows: All lobes, both lungs, show a heavy flocculent infiltration with multilocular cavities in both upper lobes. Fig. 5 shows the lung prior to the injection of air and Fig. 6 shows the lung at the last examination. This patient, although bedridden, has been made more comfortable, and weakness is the only bad symptom he complains of.

As to the future of these patients, there is a possibility of the complication of a hydropneumothorax, as illustrated in Fig. 7, in the following case. This patient (a beneficiary of the Soldiers' Home) was discharged from the hospital in 1914, with an artificial pneumothorax on one side and an inactive tuberculosis in the other lung. He returned to this

hospital a month ago with a hydropneumothorax containing about two thousand c.c. of fluid. Under the fluoroscope, the first examination was made and the waves of the fluid were clearly demonstrated on slightly shaking the patient. During his stay away from the hospital he had been working constantly and without any other bad result than the collection of fluid in the chest. The fluid is gradually being removed and air injected to replace it.

DISCUSSION.

Since it is in the hemorrhage cases that the most satisfactory results are obtained, it should nevertheless be borne in mind that it is in this class of cases that the greatest risk is also taken; for, while it is usually possible to presume that the hemorrhage is from the side showing the greatest involvement, still it is possible to collapse a lung showing considerable involvement when the hemorrhage might occasionally be from the lung showing the minor lesion. In these cases, the x ray plates have been showing small cavities in the region of the hilum of the lung that appears to be least involved. A few patients have come to the autopsy table and on sectioning the lung, the apex of the lower lobes and the middle lobe on the right side revealed very small cavities.

The condition of the chests of the tuberculous patients, found at the autopsy table, brings out the statements made in the paragraph on adhesions and pleurisy. The pathologist found great difficulty in trying to remove the lungs in such cases without tearing part of the lung tissue. If these conditions are present, it would then be useless to try to force air into such a chest. In a few cases, fibrous bands of adhesions can be released by persistent frequent injections of air. If these bands are not too strong, the chances for collapsing the lungs are very good. The gradual tearing loose of these bandlike adhesions can be beautifully studied by the radiographic

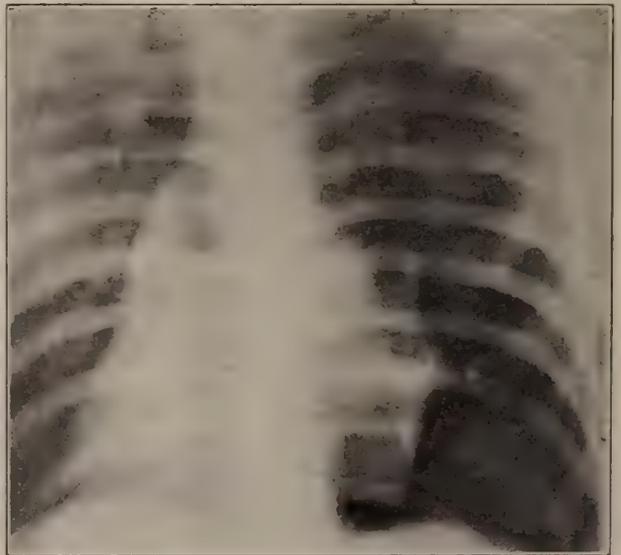


FIG. 6.—Final examination of patient (Case III).

examinations, as the treatments are continued. In the beginning, one sees air pockets formed about the adhesions with gradual thinning out; finally the desired result, the complete separation and the col-

lapse of the lung. We always find these bands attached to the upper lobes, where the greater percentage of cavities occur, and which may communicate with the periphery of the lung.

CONCLUSION.

In compressing the affected lung, the walls of the cavities are put in opposition and become fixed

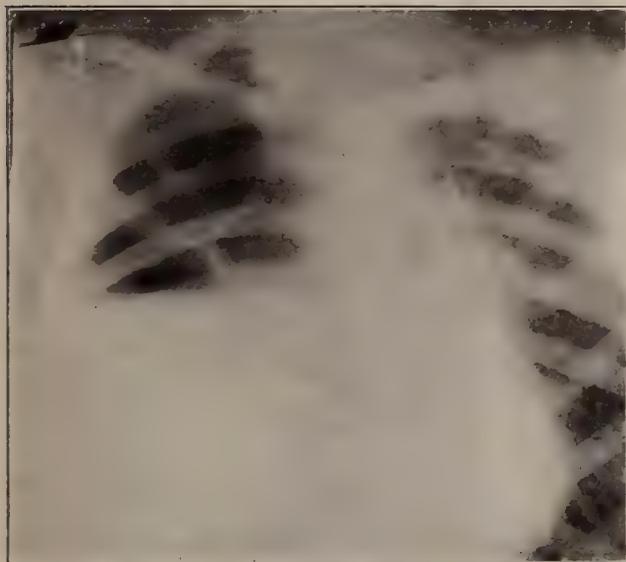


FIG. 7.—Hydro-pneumothorax as a complication.

together and the desired results are obtained, namely, giving the patient the feeling of wellbeing and comfort. Since the symptoms are lessened and comfort increased, there is no doubt in my mind that an artificial pneumothorax is an excellent adjunct to the other treatments of pulmonary tuberculosis in the advanced cases, in association with the röntgenologist, who gives the clinician the guide to the successive steps taken for collapsing the lungs. We must not forget the possibility of acceleration of the tuberculous process of the opposite lung, when one lung is collapsed and a burden put upon that lung to functionate and take care of the toxemia from the affected lung.

485 STONE AVENUE.

THE KNIFE CAUTERY IN SURGERY OF THE THORAX *

By JOHN F. VAN PAING, M. D.,
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In a recent article (1) I called attention to the importance of the knife cautery procedure as an operative technic in decreasing postoperative shock, hemorrhage, and the morbidity incidental to convalescence. It can be used in incising the visceral pleura and the lung proper, in removing foreign bodies, such as bullets, fragments of high explosive shells, and particles of bone or bits of clothing, carried into the lung tissue by the missile, and in operating for hemorrhage, lung abscess, or tumor. Before the advent of the knife cautery, pulmonary operations were the least developed and the least understood from the viewpoint of technic and post-

operative complications of all forms of surgery. The mortality rate was exceedingly high, shock and hemorrhage being the chief contributors, and the postoperative morbidity continued over a period of weeks or months.

Hemorrhage.—Heretofore hemorrhage has been very difficult to control and postoperative oozing has caused a large number of deaths, owing to the facts that suture of lung tissue is unsatisfactory in the control of bleeding and the needle punctures themselves continue to bleed after the wound is closed. Lung tissue in particular must be free from oozing when the wound is closed, or the bleeding may continue for an indefinite period, exsanguinating the patient and being almost impossible to control without a large firm packing. The removal of this packing produces a return of bleeding, and, while it is in position, it causes incessant coughing, which so greatly weakens an already overburdened heart that cardiac dilatation is likely to occur. Furthermore, iodoform or cyanide gauze will in almost every case cause some symptoms of toxemia, the absorption being so rapid that often within twenty-four hours toxic symptoms manifest themselves by rigor, vomiting, high temperature, and delirium.

Shock.—Profound shock followed by delirium accompanies a large percentage of pulmonary operations by the older methods, induced, I believe, by the combined factors of hemorrhage, anesthesia, and packing. Then, too, the class of patients in whom these operations are indicated suffer from low vitality, secondary anemia, and usually present profound toxic phenomena. Blood transfusion is, in my opinion, the ideal treatment in this condition.

Lung abscess, tumors and foreign bodies are indications for surgical intervention, and with all of these dyspnea and cardiac weakness or irregularity are prominently associated. Obviously, therefore, any procedure which decreases the danger of postoperative shock or cardiac dilatation is to be preferred.

Dyspnea.—All cases of pulmonary disease requiring surgical operation are accompanied by dyspnea, its severity depending upon the location of the diseased area, the toxic element, and cardiac compensation. Pleural effusions and hemothorax greatly embarrass respiration, and I believe it is good practice to aspirate or drain these accumulations forty-eight hours before pneumotomy is to be performed. Atropin and digitalis in full doses sometimes will temporarily control dyspnea to a great extent. When it is dependent upon increased intrathoracic pressure it is impossible to control until this pressure is relieved. Postoperatively, strychnine, administered in large doses hypodermically, diminishes respiration and may sustain the circulation through the shock period. Morphine of course is preeminent in decreasing respiration and quieting delirium, as well as controlling cough.

TECHNIC

Location of incision—external marking.—The location of the primary incision on the chest wall should conform to the pulmonary area to be incised as nearly as possible. Preliminary outlining with

*Read before the Chicago Academy of Medicine, May 27, 1920.

iodine or silver nitrate stick is useful in that it remains as a guide after sterilization of the chest wall is complete. The incision may be U shaped or longitudinal, conforming to the contour of the ribs, the primary flap consisting of skin, superficial and deep fascia down to the muscle. The muscles may be separated or incised. The number of ribs chosen is important, three being the usual number. All of them may be fractured, and reflected; or one may be fractured and removed and the one above and below displaced widely with a rib spreader or a Balfour abdominal retractor, which answers the same purpose. At this point I make a practice of tying all bleeding points and removing all forceps.

The parietal pleura is grasped with stomach forceps and the knife cautery at red heat is applied in a line about three inches in length and enlarged if necessary to admit of free access to the underlying structures. This incision in most instances should conform to the direction of the ribs. Four stomach forceps are applied to this parietal incision, and it is retracted well above and below, and stitched to the visceral pleura with single O continuous catgut on a full curved fine needle.

The knife cautery at red heat is applied to the visceral layer, the length corresponding to the parietal incision. The anesthetic is removed as the lung is approached and the cautery is used as one would use a scalpel in penetrating the lung tissue. With this method hemorrhage is practically absent except in the division of the larger blood vessels, and for the sake of safety these should be tied.

The foreign body having been removed, or the abscess drained, as the case may be, the line of incision is permitted to collapse after the insertion of a fanshaped drain of rubber tissue or a small cigarette drain, loosely covered and without gauze projecting from the end. If the wound edges are not apposed at the completion of the operation, one kidney suture of fine catgut may be used on a heated needle. The wound in the pleura may be partially closed over the drainage and a buttonhole incision made through the skin. The rib retractor is removed and the fractured rib replaced, or removed entirely, in the pus cases. The skin is closed with interrupted silk or silkworm gut and adhesive tape tightly applied, the wound is dressed and a pneumonia jacket applied.

LUNG COLLAPSE

When gas-oxygen is used with a rebreathing apparatus the lung does not collapse in a large percentage of cases, and in others only partially so, the entire operation being performed with only a slight change in respiration. The postoperative morbidity is decreased materially if we can circumvent lung collapse and the tedious convalescence of delayed reexpansion is obviated to a great extent.

Postoperative posture.—Posture is important in that it favors drainage and prevents in a great measure the respiratory embarrassment so common in chest surgery. The patient usually rests better in the semi-Fowler position, lying on the affected side. If the incision inclines posteriorly air bags or pillows should be placed to insure rest.

Postoperative attention is of great importance and the smoothness of convalescence will be in

direct proportion to the care the patient receives. Morphine and atropine hypodermically in full doses repeated until respirations are decreased to eight or ten a minute the first twenty-four hours, is, in my opinion, good treatment. A wool pneumonia jacket should be applied in every case and I believe it decreases the incidence of bronchitis or lobular pneumonia, so frequent in these cases and so serious when they occur.

Postoperative delirium.—This may be very violent in character and necessitate constant watching, or it may manifest itself as a low muttering speech and restlessness. I am of the opinion that the toxic element with its attendant fever is first in the production of delirium and secondly cardiac decompensation manifesting itself as a tachycardia, arrhythmia, or cyanosis, and due possibly to dilatation of the right heart. Cool sponging, the hot wet pack, normal salt solution with sodium bicarbonate intravenously, or blood transfusion may be required.

Cyanosis.—Slight cyanosis always is present to some extent, owing to the sudden changes in the pulmonary circulation and the attempt on the part of the heart to maintain circulatory equilibrium. Cyanosis in favorable cases usually disappears in forty-eight to seventy-two hours, but I have seen instances of its persisting for days, and this with a healed wound, regular heart, and low temperature. Strychnine and belladonna are useful in this condition, in that they sustain the patient and tend to equalize circulation.

Temperature.—Postoperative temperature is sometimes quite high for the first twenty-four to seventy-two hours, and may require a warm pack, glucose solution intravenously, or blood transfusion the second or third day following, if the temperature rises again, usually will control temperature in the favorable cases.

Delayed reexpansion.—This condition should be treated by breathing exercises, the two bottle siphon method, and an abundance of fresh air.

Sinus formation.—This sometimes persists for an indefinite period and does not seem to materially affect the general health. Phenol, bismuth, and methyl violet in a petrolatum base usually is sufficient when combined with general measures, such as rigid hygiene, nutritious diet, and hematopoietic drugs such as iron and arsenic. It will be interesting to observe the effect of mercurochrome-220 in an ointment base in these cases of chronic sinus formation.

SUMMARY

I would emphasize the following points:

1. As rapid an operation as is consistent with careful technic.
2. Accurate diagnosis relying upon the physical signs, the history, and the x ray.
3. Avoidance of delay in operation.
4. The knife cautery at red heat, to the exclusion of all other methods when the lung tissue is to be incised.
5. Avoidance of sutures whenever and wherever possible.
6. Rubber tissue in the drainage cases.
7. Strict postoperative attention with a pneumonia jacket and nutritious diet.

8. Morphine to the point of narcosis the first twenty-four to seventy-two hours.

9. Blood transfusion early and repeated if necessary in shock, hemorrhage, delirium and anemia.

10. The importance of breathing exercises and fresh air in delayed reexpansion.

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25 EAST WASHINGTON STREET.

CARCINOMA OF THE MIDDLE EAR.*

Report of a Case.

BY JOHN GUTTMAN, M. D.,
New York.

Malignant new growth of the middle ear are of comparatively rare occurrence, therefore the report of such a case should prove of interest.

CASE.—Ph. L., aged sixty years, consulted me for the first time in July, 1919. Five years ago he suffered from an attack of otitis media purulenta acuta of the left ear. The purulent discharge ceased after a time and the ear remained well until six months ago, when the purulent secretion appeared again and he began to complain of dizziness. Three months ago, some granulations were removed from the same ear. Subsequently a facial paralysis set in, and four weeks later a swelling of the zygoma region appeared, whereupon a mastoidectomy was performed by an attending aurist.

Present state: In the zygoma region in front and above the ear lobule, extending backward to the mastoid bone, there existed a swelling the size of a walnut slightly fluctuating. Back of the ear the mastoid bone showed a groove about half an inch deep,



FIG. 1.—Circumscribed swelling in the zygoma region as shown by the x ray.

caused by a previous mastoidectomy. The wound was fairly clean and its base was covered with healthy granulations. In the tympanic cavity there exists a slight purulent discharge. The left facial

nerve in all its branches and the left abducent nerve were paralyzed. There was total deafness in the left ear. The labyrinth of the left ear did not react to cold water irrigation. The reaction of the right labyrinth was sluggish. The examination of the fundi of the eye, and of the urine and blood, did not



FIG. 2.—Narrowing of the lumen of the esophagus as shown by the x ray.

show any pathological changes. The Wassermann reaction was negative and the x ray showed a circumscribed swelling in the zygoma region, and a considerable narrowing of the lumen of the esophagus. There was dysphagia. The laryngeal examination did not show any pathological change. It was doubtful whether the swelling of the zygoma region was an extension of the preceding mastoiditis into the zygomatic cells, or whether this swelling was a neoplasm. I therefore decided to explore it.

An incision in the skin was made connecting this swelling in the zygoma region with the mastoid wound. A large amount of pus and granulation tissue was evacuated. Thereupon the mastoid bone was attacked with chisel and rongeur. The cortex was found to be sclerosed, and did not show any softening. In entering the antrum large masses of neoplasm were encountered and these were evacuated. The wound was then packed and the patient returned to his bed. The diagnosis of the removed tissue made by the pathologist was squamous cell carcinoma. Six weeks later the patient died showing the symptoms of a purulent meningitis.

In all cases of this kind it is very difficult to ascertain the time and place of the onset. It is difficult to state where the primary seat of the disease was, whether in the tympanic cavity, the antrum

*Read before the Section in Otolaryngology of the New York Academy of Medicine, May 14, 1920.

of the mastoid, the petrous bone, or in the inner ear. Most cases of carcinoma of the ear show an early affection of the facial nerve. In this case the paralysis of the facial nerve was accompanied by a paralysis of the abducens nerve on the same side. The x ray picture seems to indicate that the dysphagia was probably caused by a metastasis in the esophagus, as the larynx did not show any pathological condition.

1261 MADISON AVENUE.

FREQUENT TYPES OF NASAL OBSTRUCTION AND THEIR TREATMENT.

By M. S. ITTELSON, M. D.,
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The impression is frequent that defective nasal breathing in the adult is due to a mechanical obstruction within the nasal passages and that this symptom requires operation or local treatment. This is true only in some cases. The causes that are responsible for this condition are many. The treatment too is often puzzling, as is evidenced by the variety of opinion that is sometimes expressed in a given case. Difference of opinion is to be expected here as in most other conditions, but to some extent this could be avoided. From the numerous patients who seek relief from this condition certain types can be recognized as occurring very frequently. It is well to consider the pathological conditions, both local and general, that are often found to be present in these types.

Those patients who complain of obstruction when none exists are interesting. Those with atrophy of the nasal mucous membrane, not associated with scab formation or other complications and where an intranasal examination reveals a wide breathing space, will often complain of blocked up noses. This symptom is also noticed in those on whom extensive nasal surgery has been performed. It is difficult to give a satisfactory explanation of this condition and probably several factors are involved. This is most often due to some sensory disturbance, where the patient does not feel the air either because of the involvement of the sensory nerve filaments or because of the wide passage the current of air does not exert sufficient pressure on the mucous membrane. This is well illustrated in those cases where the lumen in one side of the nostril is wider than in the other, in which case the trouble is more often referred to the open side. It is doubtful whether a sinus affection by preventing ventilation and an interchange of air within the sinuses, an interchange which normally occurs, should by itself be responsible for this symptom. In rarer cases the trouble will be found to be general rather than local. Due to a diminished alkalinity of the blood or to some other error in metabolism, there is an increased demand for oxygen, the lack of which may be referred to the nose. Occasionally, too, local and general conditions are both apparently normal and we are obliged to use such terms as nasal neurosis or nasal neurasthenia. Whatever opinion one may have as to the causes of this symptom it is important

to remember that in this type the obstruction complained of is apparent and not real.

A more frequent condition is an obstruction due to the abnormal action of the nasal mucous membrane. To perform its function of warming, moistening, filtering, and perhaps regulating the amount of the inspired air, this membrane expands and contracts, thus varying constantly the lumen of the nose. The causes responsible for this variation in dimension of the mucous membrane are often obscure, and to some extent depend on the function that is to be performed. Changes in the atmosphere, chemical and mechanical irritants, and mental emotions—all affect this highly susceptible membrane and cause it to expand and contract. This expansion is due to an increase in the blood supply, which distends the venous sinuses not unlike the erectile tissue elsewhere in the body and with little or no inflammatory reaction. The term functional obstruction is suggested for this type of cases. There are few individuals who have not occasionally experienced a sudden change from opening to closure and reversely occurring in both nostrils or more often alternating from one nostril to the other without any apparent cause.

Inflammation of the nasal mucous membrane is another condition that is frequently responsible for obstruction. Functional disturbance may occur in a normal mucous membrane: more often it occurs in one that has undergone inflammatory changes. Clinically, a chronically inflamed mucous membrane is either hypertrophied or atrophied or without change in size and it loses its moist pearl pink color which is characteristic of a normal mucous membrane. The hypertrophy or hyperplasia may be a conservative process, one of Nature's efforts to compensate for some loss of function or for some local anatomical irregularity. Thus, large turbinates are found in roomy noses and on the concave side of a deviated septum. No such utilitarian purpose is evident in an atrophic or otherwise chronically inflamed membrane. One cannot but feel that here the underlying cause is some general systemic disturbance, such as syphilis, gout, rheumatism or intestinal intoxication. It may be, too, that a disturbed secretion of the ductless glands has some influence. The relation of the erectile tissue of the nose to the gonadal glands has long been noticed. The facies of those with atrophic rhinitis is not unlike those with a deficiency of the thyroid gland. The broad nose, dry skin, and its frequent occurrence in women all suggest this, as well as the fact that the condition is less often seen in patients with hyperthyroidism. In the acute cases of inflammation the individual immunity is an important element. A virulent Klebs-Loeffler may be innocuous to some, while a bit of innocent dust will in a susceptible person excite the most violent inflammatory paroxysm.

In the treatment of these forms of obstruction much can be accomplished by the correction of any general disturbance, which even a superficial examination will in most cases disclose. Changes in the diet, the prevention of auto-intoxication, the correction of hygienic errors, and the treatment of any indefinite gouty, rheumatic, glandular or syphilitic

conditions do more good as a rule than local applications. In this connection may be mentioned the favorable action of laxatives, potassium iodide, and small doses of thyroid extract carefully administered. If the obstruction is suspected to be of an anaphylactic origin vaccine therapy and protein desensitization might be tried. As for local treatment irrigation is the one most frequently employed. Nichol's nasal syphon is well suited for this purpose, acting as it does more by suction than by pressure. A solution of soda bicarbonate, a teaspoonful to a quart of water, is less irritating than normal saline. There are some nasal membranes on which water in any form acts unfavorably. In these cases an oily preparation may be substituted. Menthol, three grains; ichthyol, thirty grains, and petrolatum, one ounce, is a prescription that can be freely used and often repeated by patients. Intranasal operations are now undertaken reluctantly. Removal of a diseased tonsil by improving the general health relieves local symptoms. Turbinectomy or turbinotomy has largely proved a failure. There are, of course, exceptions to this as to other rules, but the essential validity of this statement is apparent to all who have seen the passing of what was once a popular operation. Among the exceptions may be mentioned the removal of the hypertrophied portion of the inferior turbinate, or of an enlarged posterior tip, which is still done occasionally.

Considerable attention is now paid to the appearance of the septum. Deviation of the septum, particularly if it is of traumatic origin and limited to the anterior portion, does prevent the air from passing through, and there are few operations where the good results are more striking. On the other hand, it must be noticed that some form of septal irregularity is almost a universal condition, and a perfectly straight septum is an anatomical exception. The curves and angles that one sees so frequently on the septum are usually normal and innocent variations occurring coincidentally with some other pathological condition. Patients have a way of disappearing and it is difficult to get accurate data regarding many submucous operations. Many of these subsequently show up again at a different clinic or office with the same complaint. The surgeon thus sees less of his own unsuccessful cases and more of those of his colleagues, unsuccessful as far as the functional result is concerned, although the appearance of the septum following such operation is all that could be desired and shows evidence of surgical skill. Many feel that a submucous resection is always a conservative operation because the original incision is small and the mucous membrane is not sacrificed. In the separation of the periosteum and in the removal of the bone and cartilage considerable trauma is done which with the subsequent fibrosis often affects the mucous membrane unfavorably. Following the removal of the bone and cartilage there remains considerable redundant tissue which assumes somewhat its former position, and a deviation may persist after operation. Diagnosis of a deviated septum is easily made, but to determine its relative importance in the causation of the obstruction requires careful watching and good judgment.

CONGENITAL UNDERDEVELOPMENT OF THE RIGHT SIDE IN AN INFANT THREE MONTHS OLD.*

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CASE—J. S., infant three months old, brought to my office on December 11, 1919, by his mother because she had noticed a few days before that his left leg was much larger than his right.

Previous history.—Labor was instrumental. Baby was apparently normal at birth. He had been



FIG. 1.—Underdeveloped fibula and tibia.

fed exclusively upon breast milk and had never been ill, and until a few days before his mother had not noticed that the left side of his body, especially the left leg, was larger than the right.

*Read by title before the American Pediatric Society.

Physical examination.—This showed an apparently perfectly nourished male child. He had been all of his life and was at that time perfectly well. His only abnormality was the underdevelopment of the right side of the body, especially the right leg. The right leg was ten inches long, the left leg eleven inches long, measured from the anterior superior spine to the internal malleolus. The right thigh, one inch above the knee, was eight and one quarter inches in circumference, the left thigh was ten inches in circumference. The right foot, plantar surface, measured by placing the foot on a sheet of paper, was three and three quarter inches, the left foot, measured in the same way, was four inches. The right chest, measured from the xyphoid process to the corresponding spinous process of vertebræ, was eight and one quarter inches. The left side of the

the right and the left arm and hand were larger than the right. The most marked difference was in the size of the legs. The whole left leg was much larger than the right. This was especially noticeable in the thighs. The left foot was several sizes larger than the right. It was also apparent that the left side of his chest was larger than the right. The baby was normally developed mentally. In standing the baby on his feet it was evident that he had more strength in the left leg than he had in the right. He apparently also had more strength in his left arm and hand than he had in his right, but this difference between the left and the right side was only comparative, as the baby used his right arm and his right leg in an apparently normal way, and there was not the slightest evidence of paralysis of any kind. In fact, the mother believed that he had quite as good use of his right arm and leg as he had of his left.

Measurements on March 23, 1920, were as follows: Right leg, twelve inches; left leg, thirteen and a quarter inches; circumference of right thigh, nine inches; circumference of left thigh, ten and one half inches. Left foot four and three quarters inches long, right foot, four and one quarter inches long.

The accompanying radiograms show the underdevelopment of the bones of the right leg and the progress of development that has occurred in five months.

SEVENTH AND RACE STREETS.



FIG. 2.—Underdeveloped epiphyseal ossification centre; underdeveloped greater and lesser trochanter, as compared with left side; lesser transverse diameter of right femur, as compared with left.

chest, measured in the same way, was eight and three quarter inches. The right femur was one and four fifths inches shorter than the left. The right tibia was one and one fifth inches shorter than the left.

On March 23, 1920, the baby being then about seven months old, had remained perfectly well and had continued to be nourished exclusively upon breast milk. He weighed twenty pounds. The left side of his body was as well developed as that of any normal breast fed baby of his age, but the whole right side of his body, although there had been a marked increase in development, still remained underdeveloped as compared with the left.

The left side of the baby's face was larger than

THE RECENT INCREASES IN VENEREAL DISEASES.

An International Peril.

BY THOMAS E. SATTERTHWAITE, M. D.,
New York.

Dr. Joseph E. Moore, an American officer, consulting urologist to the district of Paris in France, has told us that following the late armistice seventy thousand prostitutes were for a time thronging the streets of that city, of whom only five thousand were registered as under police surveillance, while two thousand five hundred hotels were used for assignation purposes. He has also stated that at one time he found the incidence of infection in the American Expeditionary forces from some kind of venereal disease about 330 in a thousand, i. e., about one in three; and that there was no special effort made to lower this rate. Eventually, however, it was reduced to ninety-four in a thousand. In August and September, 1917, the incidence among five thousand British troops in Paris was two hundred in a thousand. The ratio alluded to above by Moore was said to be four times greater than elsewhere among our men in zones occupied by them, the inference being that special efforts were capable of reducing the disease, if proper measures were adopted. (1)

Someone was responsible for this wholesale infection. Was there collusion or laxity on the part of the French officials, or our own? In either case

should not the guilty be held morally, if not otherwise, responsible for failure to prevent infections, which must necessarily lead, if they have not already done so, to widespread disease throughout the United States and France. Humanity demands an investigation. Of this there can be no doubt, for public prostitution is capable of being controlled in time of war by military or civil authorities, the first naturally being the more effective. I know this from personal experience in one of the provincial towns of France, where at one time it had assumed the proportions of an epidemic. Civil control by local police, with legal punishment, such as prevails in Denmark, is also a powerful agency in this regard, provided the laws are properly administered. It may not be generally known, but I believe it to be true, from my experience, that French prostitutes are likely to be contaminated with aggravated forms of venereal diseases. We have the authority of the *NEW YORK MEDICAL JOURNAL* (2) that venereal diseases increased greatly during the war, and on the authority of Riddell, (3) there are probably more than half a million syphilitics now in Canada, forty thousand of them being in Toronto. But it is generally agreed that the increase in Europe has been more marked than on this side of the water, pointing to the probability that Europe has been largely responsible for the increase over here. This statement is also borne out by Miss Ettie A. Rout (4). According to Miss Rout the British military rate in 1917 was twenty-seven in a thousand. In 1919 it had risen to eighty in a thousand, while in the present year it is still higher. She also says "probably no European country has less than three or four times the amount of venereal diseases it had in 1913-1914."

We come now to one of the special causes of infection. Writing in the *Daily Herald*, of London, E. D. Morel (5) has stated that he was informed by letters, personal statements, and other data, which he regarded as trustworthy, that eighteen months after the armistice, when the French had from thirty to forty thousand of their colored African troops in the Bavarian Palatinate, these men were raping women and girls, so that in this zone their victims filled the hospitals to overflowing, naturally spreading syphilis, with which they were to a large extent affected, right and left. As is known to many of the medical profession, the colored race is contaminated with syphilis to a much larger degree than the white race. Recently at Fort Riley, Kansas, the incidence of syphilis among the colored troops was set at about twenty-three per cent. against about thirteen per cent. among the white (6). Though statistics on this point are not very numerous, the consensus of medical opinion is that the general incidence among colored people is much greater than among the whites.

In this connection the report of Moron (7) throws some light on the matter. He states that syphilis is not taken seriously by the colored people of Madagascar, a French protectorate. Indeed, with them syphilis in young girls is regarded as an asset, because brides are then immune against subsequent attacks, and their value in the matrimonial market is thereby enhanced. Notwithstanding, if Dr. E. J.

Dillon, the famous war correspondent and author of *The Inside Story of the Peace Conference*, is to be credited, the French military authorities not only compelled local authorities to open public brothels within the occupied zone, for their colored soldiers, but supervised and received the money for the traffic. In one page of his book he publishes a copy, in French, of the military orders in the case of a brothel at Muenchen-Gladbach, under the title: *Exploitations et police de la maison publique de Muenchen-Gladbach*. The notice gives in detail the rules and regulations of the house, both as to the men and women. Dillon publishes it in French without translation, as he infers his readers would prefer to read it in the original!

As no exception has been made, apparently, to such statements, it seems probable that the method is still practised in Muenchen-Gladbach. Indeed, it has come to the writer's notice recently that a similar brothel is being operated at Wiesbaden. The plea in defense of these practices would be that they are military necessities. In Denmark today, under its present laws, if a civilian should undertake to keep a public brothel or rent rooms for immoral purposes, he would be liable to a prison sentence. We are led, therefore, to believe not only that there is a veritable plague emanating from Europe, but that the *fons mali* is still pouring out its deadly poison, to be carried to the four corners of the universe.

I hold that this infamous traffic, as it is regarded by most Americans, can be stopped at any time by a note from Washington, for if only well known sanitary measures, such as come within the scope of police, military or civil authorities, are put in practice, as the laws of Denmark provide, the danger of infection can, I believe, be reduced to a minimum, even without the prophylactic measures that are used in our military and naval services. We cannot, of course, abolish venereal diseases now, for present sources of contagion must necessarily continue for an indefinite time to be a danger to the public, even if no new instances of the disease should occur. Moreover, we can never prevent clandestine relations.

I was present at a meeting at the New York Academy of Medicine on October 7 when a paper on present measures for limiting venereal infection was read by a prominent government official. The paper and the discussion that followed bore on the efforts that have been made by the United States Public Health Service, various boards of health and private or semiprivate associations to combat venereal diseases by public lectures, posters and publicity measures in general. These methods probably have some value. I admit it. They emphasize, however, a popular fallacy that prophylaxis can effectively *prevent*, by bureau work, backed by a liberal use of money. There is always stress laid on the latter word. No mention was made in the paper as to military or civil repression of this traffic. We should not be led astray by visionary views. On the contrary, our opinions should be based on those of practical men who have dealt successfully with such problems. The strong arm of the law is, and always will be, the most deterrent force.

As Moore has said, probably one third of the cases of infection he has described would have oc-

curred in his Paris experience any way, under the license then prevailing. Given the cupidity of the prostitute, the money of the American soldier, the opportunity easily afforded, the recklessness of men and women, and conditions were present for infection, notwithstanding the warnings of humane associations, public service organizations, or the like. In fact, while these various agencies have something of a deterring force, venereal diseases have also increased rather than diminished, as I have shown. We should also remember that in the case of sanitary prophylactic measures, the belief that they will prevent contagion may widen the doorway to immoral relations.

Miss Ettie A. Rout, a New Zealand Government authorized reporter and honorable secretary of the New Zealand Volunteer Sisters, who has already been referred to, says on this point (8): "We found that French and Belgian public women were quite ready to attend a Red Cross dispensary for prophylactic treatment and quite ready to accept prophylactic outfits from the soldiers. (We had the directions printed in French and English.)" In other words, "Employ regulation safeguards and you run little risk." What a satisfactory statement for the inmates and patrons of brothels. Miss Rout's paper is called the *Conquest of Venereal Disease*. Might it not quite as appropriately have been called, *Promiscuous intercourse made comparatively safe by scientific methods?*

Now assuming from Miss Rout's given title in her article that she is a New Zealander, and that the New Zealand troops in the war as a class were clean and healthy men, as they are reputed to have been, would not some of them nevertheless, under the tutelage of Miss Rout's associates who appear to have opened the door for them to comparatively safe promiscuous intercourse, have eventually become infected, provided their experiences were sufficiently large?

Certainly the prophylaxis as practised in military and naval life does not prevent infection so surely as vaccination against smallpox. In fact, Miss Rout asserts that prophylaxis is successful when properly applied in only two thirds of the cases, as shown by the returns of the American, Canadian, and Australian armies, as against the almost complete protection claimed by Moore in his personal experiences.

Why lay so much stress on prophylaxis when all authorities agree that, except in accidental cases, abstinence is the only practice that really prevents; and medical men, in general, say it does no harm to men or women. I do not propose, however, to discuss the moral side of these prophylactic measures; but will say that notwithstanding their use, it is shown that infection will occur sufficiently often to make immoral relations dangerous to one's life and health, and the individuals infected a menace to society.

This statement cannot be confuted successfully. Even from the viewpoint of protection, such measures will not stand the crucial tests of actual conditions. Take life in Europe today, among civilians in the many localities where they are still bearing the burdens and sorrows of the war. Poverty and hun-

ger, produced by embargoes on food for which Americans are to a large extent responsible, lack of work, and the high cost of living, with a currency depreciated by the results of the war, while thousands are kept alive simply by the generosity of a comparatively few philanthropic Americans make women and girls the easy prey of licentious soldiers, especially if they are Africans, armed with brief authority and backed by military officers who have neither fear of God nor man before their eyes. How can such a depraved condition of things be remedied by lectures, posters, or any other form of publiclicity? Intelligent people know it cannot. Or is it to be supposed that where brothels were opened on the outskirts of our camps, during the late war, lectures or literature effectually restrained our youth. We know they did not. I am certain from personal experience at home and abroad that public prostitution, our greatest danger, in this regard can be controlled by the law. Public women, of course, have the greatest opportunities for producing infection and are almost certain to be infected sooner or later. To regulate by military or civil forces this feature of the case, therefore, would be the method most effective in results of any in the prophylaxis of venereal diseases.

Therefore, let us first of all bend our efforts to suppressing the public traffic by the well known methods, which are simple, efficient and economical, and let other methods, such as those I have described which are largely theoretical, expensive and inefficient, if not in some cases immoral, have a secondary consideration. These facts can, however, be brought into a clearer light, if some of these scandalous practices that I have mentioned, whether international or national, are made themes of a Congressional inquiry. Fortunately we have at hand many high in Government circles who have had an opportunity of witnessing some of the orgies I have described, in foreign lands. Their testimony might be most valuable; indeed, we should recognize that Europe is the source of the venereal diseases that just now are threatening civilization.

There are various reasons why an inquiry into this topic should emanate from the Government. The profession of medicine is, as a rule, fearful that under the pressure of outside influence laws will be introduced compelling them, on the witness stand, to violate the tenets of professional secrecy. Fear of it would prevent many of the laity from telling the truth about themselves. Moreover, inasmuch as venereal diseases prevail more or less extensively in the practice of every physician and surgeon, compulsory notification would remove a source of considerable revenue. Indeed the patient might prefer to use nostrums to having his disease exposed on the public records. To be sure, if notification were made compulsory we may be quite certain physicians would not be likely to carry it out and public opinion would sustain them. In fact, compulsory notification could not be carried out successfully in American circles at the present time. But as a result of compulsory notification laws the disease, though perhaps making alarming strides forward, would apparently be diminishing, according to the reports of our public health authorities. Again by

a government inquiry the public should be officially informed of the real dangers of these diseases and the comparative values of prophylactic measures. For example, if the following queries were taken up at such an inquiry, under the subjoined heads, as bearing on the Parisian scandal, they would be productive of the most valuable results to our people at large. The topics to be taken up might be:

1. Could public women in France have been successfully quarantined?

2. Could not the danger of contagion have been prevented by the withholding of passes, by the military or naval authorities?

3. Is abstinence harmful to men or women?

4. Is not the public woman the source of the greatest danger?

5. Is the furnishing of public women by sociological associations with prophylactic packets a safe procedure, or a moral one?

6. What is really the ratio of effectiveness by the prophylactic measures pursued in military and navy circles?

Certainly if we joined the League of Nations as at present constituted, would we not be expected, to at least give tacit consent to the maintenance and regulations of military brothels, such as have been in operation recently, and probably are now, under the guise of military necessities.

Now while the statements I have made in this paper, based on the reports of government officials, will probably be accepted as true by the medical profession at large, we need not expect they will be accepted by all of the sociological workers who have visited the areas referred to. This attitude on their part, which has already been observed by the writer, was to have been expected, and for various reasons. In many instances the men and women sent over to supervise the work of their associations or gather material for home consumption, were either ignorant of foreign languages or of the nature of the diseases, or otherwise unqualified; or they thought it unpatriotic to tell of unpleasant conditions noted in their work. This remark applies to the clergy as well as to the laity employed in such missions.

We may, therefore, expect no help from any of them unless it can be shown that now we require the truth, and it is pseudopatriotic for them to withhold it. But, after all, prophylaxis in venereal diseases is essentially a medical problem and it is, therefore, most fitting that efforts to solve it should emanate from the medical profession.

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7 EAST EIGHTIETH STREET.

INSTRUMENT FOR SIMPLIFYING TONSILLECTOMY BY SNARE.

By ISIDOR F. SHAPIRO, M.D.,
New York.

The saving of time at a critical juncture in the course of the snare operation has been effected by the use of the instrument shown in Fig. 1, which I have devised. It consists simply of a Hurd dissector onto which has been brazed part of a Weder tongue depressor. This saves the operator the trouble and extra motions that go with two separate instruments and permits a considerable saving in the time of the operation, which is important for a patient under a general anesthetic. It also reduces the



FIG. 1.—Combination tonsil dissector and tongue depressor.

amount of hemorrhage and sponging which, after all, is traumatic and is to be avoided as far as possible. All these advantages are especially apparent when the operation is done without many assistants or at the patient's home, where there are no suction facilities. The loss of blood is reduced when the suction method is used, on account of the saving of time of operation.

355 EAST 149TH STREET.

Influenza in the Tuberculous.—Maurice Fishberg and Ernst P. Boas (*American Journal of the Medical Sciences*, August, 1920) state that in an outbreak of influenza in the tuberculosis pavilion of the Montefiore Hospital during January and February, 1920, twenty-eight out of 127 patients were affected. The proportion seems to be about the same as might be expected among nontuberculous individuals. The clinical form of tuberculosis and the stage of the disease had no influence on the tendency of the patients to contract influenza. Of the twenty-eight patients who contracted influenza nine died, which is a higher rate of mortality than is generally observed. Of the twenty-eight patients with influenza, twenty-two developed bronchopneumonia, again a rate much higher than is usually seen. It seems that the tendency to complicating bronchopneumonia varies with the epidemic. During the epidemic of 1918 this complication developed in a smaller proportion of patients and the mortality was lower. The clinical course of the influenza resembled that seen in the nontuberculous. The tendency to develop complicating bronchopneumonia bears no relation to the stage, clinical form, or acuteness of the tuberculous process in the lung and pleura. In nearly all of the patients who recovered the complicating disease had no appreciable influence on the tuberculous lung lesion, so far as could be ascertained by physical exploration of the chest or on the subsequent course of the disease. They cannot say that the anergic state brought about by influenza had an influence on the incidence, course and termination of this disease in the tuberculous.

Editorial Notes and Comments

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VENEREAL PROPHYLAXIS

The venereal problem is one that has confronted the world for many centuries. Slowly, very slowly, have we gained accurate knowledge regarding the transmission of venereal diseases. First of all our efforts were directed to cure. Then diagnostic methods were perfected and we found that our hospitals and homes were filled with victims of syphilis and gonorrhoea. These victims ranged from the fetus killed in the uterus by a syphilitic virus to the latent manifestations in general paresis. Between these two we found a formidable host of lesions attacking every portion of the body—the eyes, the bones, the nervous system, the skin and viscera—no structure escaped. Blind babies were born. This is not a sentimental plea, but a statement of reality. Textbooks were written and various ways and means devised to combat the results of the twin evils, gonorrhoea and syphilis.

Finally, the more sane realized that this ghastly army of the sick and disabled did not need to exist. Ibsen and Brioux portrayed from the stage the results of venereal infection. The less timid gave support; the reactionaries attempted to suppress. Professional uplifters crusaded and attempted to clean up communities. But the practice of the genitourinary specialists did not decrease. The enforcement of prophylactic care of the eyes of newborn babies, however, decreased the number of blind babies. Then came the great war where the youth of our so-called civilization pitted themselves one against the other in the field of battle. Some say that man in his in-

genuity could have prevented that catastrophe. However, we shall not discuss the point. Others may take up their cudgels in protecting man from his own folly in war; we as physicians will deal with his follies of health.

This week we are presenting the paper of a most earnest physician, Dr. Thomas E. Satterthwaite, who has seen many of the venereal problems that were brought to a focus during the war. While we do not agree with all he has to say, there is so much truth in what he says, that we feel it should be published, even though we do not believe in the efficacy of the tactics by which he thinks the venereal problem can be solved. He takes issue with Miss Rout, of New Zealand, Riddell, of Toronto, and a host of others on the question of the advisability of the use of prophylaxis. His two objections are: It will increase illicit intercourse, and the prophylaxis is not effective in every case. In regard to the first point, it is difficult to conceive how this would be possible on the face of things. Civilization plunging along at a mad pace, with its countless sexual stimulants, the press, the theatre, the cinema, clothes designed to lure and captivate, and the monetary incentive to prostitutes and their accessories, all these tend to sexual excitation. The gonadal powers of youth are awakened prematurely. It is difficult to conceive how venereal prophylaxis is going to increase venereal diseases under these conditions. It is well to consider the entire background and not focus too sharply on one particular spot. Dr. Satterthwaite carefully quotes only part of Miss Rout's paper, which appeared in the *NEW YORK MEDICAL JOURNAL*, October 9, 1920; he does not go into the statistics of her experience with the soldiers on leave in Paris. We all know that prostitution flourished there, especially during the war. It would be interesting to go into the economic reason for this; much food for thought would come out of this study. However, she proved that venereal infection was decreased to a minimum. She showed that continence could not be enforced. Man is a complex animal and the sexual urge is great. The intellectual level is not equal and it is not possible to prevent illicit intercourse.

How are prophylactic measures going to increase the number of illicit relationships? The feeble answer is that it will make intercourse safe. On the other hand, with the prophylactic measures a certain amount of education is necessary and is sure to follow. The prophylaxis calls to mind not the safety of the sex relationship but the danger. With the reminder and the realization that follows men

and women will seek early treatment when infected. The entire question will come to light and not be suppressed. We shall be able to discuss the subject without the age long inhibitions that have surrounded us. We shall be able to fight the foe where it can be seen. The method of suppression urged by Satterthwaite has never proved successful in any field of human affairs; we have nothing to show that it will be more effective for the venereal problem. We cannot, by force or any other means, push the problem into the dark where it will fester and break out anew. We need more light, more light.

ELECTROTHERAPEUTICS IN THE TREATMENT OF PARALYSIS.

Electrotherapy has not been accorded the position which is its due in the treatment of certain conditions. Perhaps, by some its therapeutic efficacy has been exaggerated, but in certain forms of muscular paralysis electricity plays a rôle of no mean importance. Mr. H. S. Souttar, F. R. C. S., assistant surgeon and director of surgical unit, London Hospital, in a paper read before the British Medical Association, laid emphasis on the fact that in the care of a limb in which a nerve has been severed there were many considerations other than those that appear on the surface. The inevitable paralysis of a certain group of muscles carries with it a whole train of consequences, many of which are by no means inevitable. Leaving on one side the muscles directly affected, the loss of the normal range of movement will lead to the formation of adhesions between other muscles, around tendons, and within joints. The limb may readily fall into positions of deformity which give rise to the stretching of muscles and ligaments, the skin itself will suffer from disuse, and the limb will suffer from its corresponding loss of excretory power. It is therefore evident that in estimating the value of any one method of treatment the limb as a whole must be considered and the vision must not be bounded by the narrower field of the small group of muscles which may be paralyzed.

In the application of electricity the primary object is to evoke contractions in the paralyzed muscle. By doing so it is compelled to fulfill its normal functions, in however diminished a degree, and the universal experience is that this is essential for the prevention of atrophy in any tissue. The tissues require for their nutrition something more than the supply of food, even something more than perfect innervation. They must work, and according to Souttar electrical stimulation can do for the muscle something quite out of the reach of any other method. Indeed, the *prima facie* evidence of the

value of contractions of paralyzed muscle is so overwhelming, that it would require the strongest practical evidence of their uselessness to justify their being ignored. Yet, if electrical treatment is to be really effective one condition must not be overlooked: if the muscle as a whole is to receive the same benefit as the fibres which contract, it must be made to contract as a whole, and this result is often exceedingly difficult to obtain. As Souttar pointed out, the ideal means of stimulation would be the passage through the whole limb of a current which would stimulate the paralyzed muscles, leaving the intact muscles undisturbed. This is not as yet solved, although the researches of Lapique and of Turrell have brought this ideal within measurable distance. For the contraction of paralyzed muscle special forms of current should be developed. The discovery of some simple means by which the contraction of every fibre of a paralyzed muscle could with certainty be obtained would give a powerful impetus to treatment.

Souttar holds the view that there is little fear of overfatiguing paralyzed muscles by continued stimulation. Major Cooper has put the matter to a direct test and has found that after six hundred contractions in fifteen minutes a paralyzed muscle showed no evidence of fatigue. Consequently, it seems to be indicated that each muscle might be exercised for a longer period than is usual with great advantage. As for the faradic current which does not produce contractions Souttar is of the opinion that apart from its indirect action through the muscles, it is probable that a faradic current has a direct stimulating action upon the circulation, either upon the vessels themselves or through the sympathetic system, and in this way it may have a direct action upon the vitality of the limb as a whole.

But further it has recently occurred to him that a faradic current stimulating the muscles antagonistic to those which are paralyzed, might probably have a good effect. While no evidence exists to show that the mere passage of a current through a limb has any effect on the growth of a divided nerve, there is every reason to suppose that the growth of a divided nerve is influenced by the activity of the cell from which it arises, and Souttar asks what better means could be found of stimulating the anterior horn cell than the production of the physiological reflex arising from the contraction of the antagonistic muscle group?

There is little doubt that there is a great future for the electrical treatment of paralysis caused by nerve injury. It also appears certain that the modes of applying such treatment are developing in a satisfactory manner. However, those who apply the

treatment should be experts and thoroughly understand the end they have in view. Much has been learned in this direction during the war, and it is to be hoped that this knowledge will be developed so successfully that it will be put to the best use in industrial medical practice. There is a wide scope for electrotherapeutics in this field.

PHYSICIAN-AUTHORS: DR. WILLIAM
HENRY DRUMMOND.

There are two predominating groups of people in the eastern provinces of Canada, the English and the French, and there are remote historical reasons, taking us back to the days of New France, why these two groups have not been wholly in political and social harmony, despite the fact that for so many decades they have been fellow countrymen sharing the advantages and the burdens of a great and growing dominion. Today, however, these two great groups are more nearly in sympathetic touch with one another than ever before. A number of contributing factors have brought about this spirit of concord, and Canadians of both groups agree that not the least of these factors was a big, warm hearted, whole souled Irish physician who, in odd moments of leisure when his practice was not too pressing, found time and inspiration to wield his pen for the entertainment of his family and friends. This man was Dr. William Henry Drummond, of Toronto, Ontario.

Poetry was Dr. Drummond's medium, and by means of it he interpreted with a kindly sympathy, a tender pathos and an inimitable humor the simple life and characteristics of the *habitants* of Ontario and Quebec. It was the first time the French-Canadian farmer had been utilized as a literary figure, except when some ribald scribbler poked fun at him and his patois. French-Canadians were inclined to resent Drummond's poetical effusions at first. They glanced at them without reading and assumed that they were merely another attempt to make a laughing stock of the simple minded *habitant*. But after they had been induced to read them, and realized that here was a sincere attempt to present the *habitant* in a clean and pleasing way, their praise knew no bounds, and today there are no greater admirers of Dr. Drummond's poetry than the French-Canadian element.

In the preface to his first volume, *The Habitant*, he says: "Having lived practically all my life side by side with the French-Canadian people, I have grown to love and admire them, and I have felt that while many of the English speaking people know, perhaps as well as myself, the French-Can-

adians of the cities, yet they have had little opportunity to become acquainted with the *habitant*, therefore I have endeavored to paint a few types, and in doing this it has seemed to me that I could best attain the object in view by having my friends tell their own tales in their own way, as they would relate them to English speaking auditors not conversant with the French tongue." This was the spirit, then, which served to bring the two racial divisions of *The Lady of the Snows* a step or two nearer a friendly fellow feeling. The good spirit and tempered delicacy Dr. Drummond displayed in the treatment of the *habitants* created an equally pleasing impression in the English speaking world. *The Habitant* was followed by three other volumes of French-Canadian poems—*The Voyageur*, *Johnny Courteau* and *The Great Fight*. These four volumes had a vogue in their day that was almost unparalleled in the history of modern verse, not only in Canada but in England and the United States as well. They still have a steady sale in Canada.

If Canadian literature were of maturer development perhaps Drummond's poetry would in time pass into oblivion, for it is not great poetry. But Canadian literature is still in its infancy and this man's work seems assured of perpetuity because, as Dr. Louis Frechette, the Poet Laureate of Canada, has said, "he was a new pathfinder in the land of song."

Dr. Drummond was born on April 13, 1854, in County Leitrim, Ireland, and passed his boyhood in the village of Tawley, near the Bay of Donegal. When he was ten years old the family removed to Canada, and shortly thereafter the father died. Being the eldest son, young Drummond had to set about finding ways to help his widowed mother, and so he learned telegraphy. He became a full fledged telegrapher in the lumber camp village of Bord-a-Plouffe, on the River des Prairies, and there came into contact with those *voyageurs* and *habitants* whom he later wove into his poems. The songs they sang gave to his style its mould and spirit. His poems are, for the most part, merely metrical renditions of their quaint tales of backwood life. After a few years of work he was able to attend McGill University, and later Bishop's Medical College, where he got his medical degree in 1884. His first medical work was as house surgeon at the Western Hospital in Montreal, and subsequently he took up the practice of medicine in the little village of Stornoway, near Lake Megantic. After two years there and two more at the village of Knowlton he returned to Montreal, where he practised until his death on April 6, 1907, in the Cobalt mining district, where he had gone to fight an epidemic of smallpox.

In Stornoway and Knowlton he gathered impressions and material for his pictures of *The Canadian Country Doctor* and *Ole Doctor Fiset*. In Montreal Dr. Drummond lived in an old house on Mountain Street which had been the home of Jefferson Davis, the exiled President of the Confederacy, and it was there he wrote practically all of his poems. In addition to his practice he for several years occupied the chair of medical jurisprudence in his alma mater. In recognition of his literary achievements the University of Toronto in 1902 conferred upon him the degree of LL. D. and subsequently he was elected a fellow of the Royal Society of Literature in England and of the Royal Society of Canada. These, with the degree of D. C. L. from Bishop's College, made up the sum of his literary honors.

A HUGE JOKE

To ordain by legislative enactment that alcoholic liquors shall be medicine and then watch and spy upon, haul into court and fine any doctor who oversteps the bounds set by a license commission, is one of the greatest jokes ever perpetrated on a community. This is what the Ontario Temperance Law does for the physicians of that province. The farce goes further. Seven dispensaries are distributed throughout the land, two being located in Toronto where there is only one fifth of the population. No wonder there is a lot of so-called sickness in Toronto, markedly intensified every weekend. Nearly all the illustrious legislators, many of them great legal luminaries, who were instrumental in framing and passing this wonderful piece of legislation, have by the will of the people been left to the comfort of their own firesides, and cellars, but new ones are in the saddle riding the governmental steed. They ride, but so far as controlling the beast, they lack control, for have they not a special commission inquiring into the administration of the Ontario Temperance Act which, from one end of the province to the other and from Lake Ontario and Lake Erie to the confines of Hudson Bay is of questionable repute. When the inquiry is completed the medical profession may have some measure of relief. At all events that is their prayer.

Few express any desire for a return to the open bar. Some may wish to get their so-called medicine now and again without recourse to the doctor and the added cost. The act is iniquitous in that it discriminates in the rich man's favor. To the profession it is burdensome in that they have to carry the stigma of harboring in their ranks three or four hundred unscrupulous physicians who fatten their averages by the medicinal prescription.

OCULISTS AND PEOPLES.

The beauty of a pretty workgirl is not enhanced by huge goggles, nor is a young man made more prepossessing by their use, yet, in the long processions lunchwards, homewards, which trips and stumbles and strides through our streets, there are hundreds wearing glasses. If asked by the oculist as to the lighting of store or factory or office the ready answer will be that there is "plenty of electric light; quite a glare of it." But the oculists on the Board of the Industrial Accident Commission define light as "that quantity and quality which enables normal eyes to work without discomfort," and they are trying to make employers see the economic advantages of supplying this. When the light is insufficient the eye keeps changing its focus in a vain effort to detect details. This constant drawing up and releasing action of the fine muscular construction results in strain and definite fatigue. Also, a bright light suspended in the line of vision, or a sharp contrast and flickering on the eye gives the extra work of constant adjustment. This is not only a serious strain, but introduces a neutral stage of the pupil action by the lagging of tired muscles, which results in a momentary, partial blindness, making it almost impossible for a worker to observe the graduations of a precision instrument or lay out fine work in detail.

THE NERVOUS COW.

It is little realized by the laity how much the health of animals affects our own, nor how much is being done in the veterinary world on this account. There is the question of abortion in cows and its relation to human mothers, of tuberculosis as affecting everyone, and, greatest of all, the distribution of pasteurized milk unfreed by protection against subsequent contamination. There is even published a large veterinary dentistry, but it is not difficult to imagine that a bull or a horse would require some patient handling when toothache set in. One veterinary has had a cow suffering from nervous shock. She could not bear anyone near her, and walked with a stiff, irregular gait, making the motions of stepping over an obstacle before she came to it. Sodium cacodylate and restful solitude in a darkened stall led to a complete cure. It is rather difficult to believe, but pigs also are delicate, nervous animals, and require more care than cows.

PREMATURE BURIAL.

Every year gloomy little articles are issued concerning the burying of the living and advising the dead to have their veins opened and various other devices are suggested to ascertain their real condition. Out in Akron, Ohio, one William Wirt found himself on a memorial tablet erected to those who had died in France. He says there are nearly two thousand so commemorated in different States who have since been traced as living. He suggests starting a Club of Dead Men. Perhaps he means a hermitage where they could forget the world and be forgotten by it. These soldiers have been officially declared dead. How does the law stand?

News Items.

A Vaccination Campaign in New York.—During the month of September 25,453 vaccinations were performed in Greater New York by medical inspectors of the health department, compared with 12,029 during August.

Tuberculosis Clinics in Ontario County.—Under the joint auspices of the Ontario County Tuberculosis Committee and the Geneva Health Bureau a monthly tuberculosis clinic has been established in Geneva. Up to the middle of August a total of 117 patients had been examined.

Hospital at St. Mihiel to Be War Memorial.—Cooperating with the French Government, the junior section of the American Red Cross Society will finance the erection and operation of a hospital for children at St. Mihiel, France, in memory of the first great American battle effort of the war.

The Length of Human Life.—The average duration of life in India is less than 25 years. In Sweden it is over 50 years; in Massachusetts, 45 years; in Denmark it is 51.17; in France, 47.4; in England and Wales, 45.9; in Italy, 42.9, and in Prussia, 42.8. In Geneva, where records are available for the past three centuries, the sixteenth century showed a life span of 21.2 years, the seventeenth century showed 25.7 years, the eighteenth, 33.6 years, and the nineteenth, 39.7 years.

New Quarters for Health Department Venereal Disease Clinic.—The Department of Health of the City of New York announces the removal of its Manhattan Venereal Disease Clinic to the department headquarters at 505 Pearl street. This clinic was established in compliance with the State venereal disease law and is intended for those who cannot afford to pay the charges made by dispensaries. The medical profession is invited to refer to this clinic such patients as are believed to be suitable for free treatment.

Civil Service Examination for Anatomist.—The United States Civil Service Commission announces an examination for the position of anatomist in the office of the Surgeon General, Army Medical Museum, Washington, D. C., at \$1,600 a year, plus increase granted by Congress of \$20 a month. The duties of the appointee will consist of the preparation of gross and histological material, their reproduction in drawings, photographs, or paintings for illustrative purposes. Those interested should apply for Form 1312. No applications will be received after December 7th.

New York Neurological Society.—A joint meeting of the New York Neurological Society and the Section in Neurology of the New York Academy of Medicine will be held on Tuesday evening, November 9th. Dr. Hyman Climenko will present a case of Nanism and Dr. A. L. Soresi a case of Psychosis following Surgical Operation. Dr. Joseph Byrne will read a paper on Pupil Dilatation and the Sensory Pathways, illustrated with lantern slides. Dr. Samuel Brock will present a study in motor aphasia of the Cortical or Mixed Type, with report of a case, and Dr. Karl Winfield Ney will describe the operation and findings in the case.

Improvements at Glen Ridge Sanatorium.—The Board of Supervisors of Schenectady, N. Y., has voted \$50,000 for repairs and improvements to be made at Glen Ridge Tuberculosis Sanatorium. In addition to extensive repairs, a new pavilion is to be created, a cooling system installed, and the present administration building enlarged.

Christmas Seal Campaign.—Active preparations are being made for this season's Christmas seal campaign to raise funds for antituberculosis work, which will open on December 1st. New York State's quota this year will be \$582,000. Last year a total of \$375,000 was raised in New York State, outside of New York city, for the work of national, State and local tuberculosis organizations.

Wisconsin Cancer Committee.—The State Medical Society of Wisconsin recently appointed a committee for the study of cancer, with the following membership: Dr. J. P. McMahan, of Milwaukee, chairman; Dr. Edward Evans, of La Crosse; Dr. W. A. Ground, of Superior; Dr. C. H. Bunting, of Madison, and Dr. W. K. Grey, of Milwaukee.

Menorah Hospital.—Nearly \$25,000 was contributed at a dinner held at the Hotel Bossert on October 17 to the building fund of the new Menorah Hospital at Coney Island. The new institution will be nonsectarian, and will receive both acute and chronic cases. For the purchase and equipment of the hospital \$400,000 is required.

Sanitary Survey of Interstate Park.—At the request of the Public Health Council a sanitary survey is being made of the Palisades Interstate Park. This park consists of about 36,000 acres and is situated between the palisades along the Hudson River and the Ramapo Mountains, partly in New Jersey and partly in New York. About sixty camps are maintained throughout the park and this survey includes detailed studies and inspections of the water supply and sewage disposal.

American Academy of Ophthalmology and Otolaryngology.—At the twenty-fifth annual meeting of this organization, held in Kansas City, Mo., on October 15th, the following officers were elected: President, Dr. Emil Mayer, of New York; first vice-president, Dr. John R. Newcomb, of Indianapolis; second vice-president, Dr. Robert Ridpath, of Philadelphia; third vice-president, Dr. W. C. Finnoff, of Denver; treasurer, Dr. Secord H. Lodge, of Cleveland; secretary, Dr. Luther C. Peter, of Philadelphia; editor of *Transactions*, Dr. Clarence Loeb, of Chicago. Next year's meeting will be held in Philadelphia.

Philadelphia Medical Club Nominations.—At a recent meeting of the Medical Club of Philadelphia the following officers were nominated for the coming year: President, Dr. Barton Cooke Hirst; first vice-president, Dr. Hobart A. Hare; second vice-president, Dr. Alexander MacAlister; secretary, Dr. William S. Wray; treasurer, Dr. George A. Knowles and Dr. Lewis H. Adler, Jr.; governor, Dr. G. Orm Ring and Dr. Walter L. Pyle; additional directors, Dr. John A. Sherger, Dr. B. Frank Wentz, Dr. Wilmer Krusen, Dr. Howard A. Sutton, Dr. S. MacCuen Smith, Dr. Thomas R. Neilson.

Dentists Cooperate in Campaign Against Venereal Diseases.—Of the forty thousand licensed and registered dentists in the United States, 15,252 have signified their intention of cooperating fully with the United States Public Health Service in its national campaign for venereal disease control, agreeing to report all venereal disease cases which come under their observation in their practice in accordance with the laws and board of health regulations, and to advise treatment in all such venereal disease cases which come under their observation, referring them to a clinic or to a physician known to be competent in the treatment of such cases.

The Alvarenga Prize.—The College of Physicians of Philadelphia announces that the next award of the Alvarenga Prize, amounting to about \$250, will be made on July 14, 1921, provided that an essay deemed by the Committee of Award to be worthy of the prize shall have been offered. Essays intended for competition may be upon any subject in medicine, but cannot have been published. They must be typewritten, and if written in a language other than English should be accompanied by an English translation, and must be received by the secretary of the college, Dr. John H. Girven, 19 South Twenty-Second Street, Philadelphia, on or before May 1, 1921. No prize was awarded for 1920.

Meetings of Local Medical Societies.—The following medical societies will meet in New York during the coming week:

MONDAY, *November 1st.*—Medical Society of the New York Polyclinic Medical School and Hospital.

TUESDAY, *November 2d.*—New York Academy of Medicine (Section in Dermatology and Syphilis); Medical Society of Harlem Hospital; New York Neurological Society; Society of Alumni of Lebanon Hospital.

WEDNESDAY, *November 3d.*—New York Academy of Medicine (Section in Historical Medicine); Bronx Medical Association; Harlem Medical Association; Psychiatric Society of New York; Society of Alumni of Bellevue Hospital; Brooklyn Society for Neurology.

THURSDAY, *November 4th.*—New York Academy of Medicine (stated meeting); Brooklyn Surgical Society.

FRIDAY, *November 5th.*—New York Academy of Medicine (Section in Surgery); New York Microscopical Society; Practitioners' Society of New York; Alumni Association of Roosevelt Hospital; Gynecological Society of Brooklyn (annual).

SATURDAY, *November 6th.*—Benjamin Rush Medical Society.

Gifts to Columbia University.—Among the twenty-one gifts aggregating \$27,902.80, in addition to a valuable collection of books forming the nucleus of a memorial library, announced by Columbia University, are the following:

From the Borden Company, of New York, \$10,000 to be added to their previous gift for research in food chemistry and nutrition, carried on under the direction of Professor Henry C. Sherman.

From William S. Grosvenor, of Providence, R. I., \$2,500 to establish the Grosvenor Memorial Fund in memory of Robert Grosvenor, a former member of the 1918 class in medicine. The income of the fund is to be used to purchase books for the library of the medical school.

From Mrs. Elizabeth S. Coolidge \$2,400 for the maintenance of the Coolidge Research Fellowships in Medicine.

From the classmates of the late Alexander Weinstein, a member of the class of 1920, \$800 to establish the Alexander Weinstein Memorial Fund, the interest of which is to be used for the purchase of books for the library of the medical school.

From an anonymous donor \$237.80 to be applied toward the completion of the equipment of the surgical laboratory.

War Department Sells Hospital Supplies.—The Surplus Property Branch of the Office of the Quartermaster General of the Army has sold to the Thomas & Kelly Co., of Boston, the remaining surplus of bandages and absorbent cotton, purchased for the use of the Army during the war, the sale netting the Government more than \$1,000,000. The bandages alone represent a quantity sufficient to supply the hospitals and surgeons of the United States with all their needs for at least eighteen months. Included in the sale were a million dozen roller and between two and two and one half million compressed bandages, and approximately two and one quarter million one ounce packages of absorbent cotton.

Psychiatric Institute to Be Expanded Into a Psychopathic Hospital.—A bill has been signed by Governor Smith which provides for the transfer of the Psychiatric Institute from Ward's Island to a site to be obtained in New York, where it will be expanded into a psychopathic hospital and outpatient department for the reception, study and treatment of patients. The bill authorized the appropriation of \$700,000 toward the construction of such an institution when a site was available. A hospital of this kind, by preventing and curing cases of mental disease in incipient and early stages, would save the State the expense of the continuous care of chronic cases for long terms of years in the State hospitals.

Died.

BULLOCK.—In Upland, Pa., on Monday, October 18th, Dr. Edwin G. Bullock, aged thirty-seven years.

CRONEMILLER.—In Los Angeles, Cal., on Monday, October 11th, Dr. Mary M. Cronemiller, of Sacramento, aged fifty-nine years.

EALER.—In Philadelphia, Pa., on Sunday, October 17th, Dr. Percy H. Ealer, aged sixty-two years.

EBERSOLE.—In Cleveland, Ohio, on Tuesday, October 5th, Dr. W. G. Ebersole, aged fifty-six years.

FLEISCHMER.—In Manila, Philippine Islands, on Monday, September 20th, Dr. H. J. Fleischmer, of Chicago, aged fifty-five years.

IVES.—In Pecatonica, Ill., on Sunday, October 10th, Dr. Charles G. Ives.

LYONS.—In New Rochelle, N. Y., on Tuesday, October 12th, Dr. George A. Lyons.

MACDOUGALL.—In Haverhill, Mass., on Saturday, October 16th, Dr. Duncan MacDougall, aged fifty-four years.

MACKENZIE.—In Trenton, N. J., on Tuesday, October 19th, Dr. Thomas H. MacKenzie, aged seventy-three years.

MOODY.—In Sunbury, Pa., on Saturday, October 16th, Dr. William M. Moody, aged eighty-six years.

O'REILLY.—In Middletown, N. Y., on Wednesday, October 13th, Dr. James A. O'Reilly, of Brooklyn, aged thirty-three years.

SEARS.—In Beverly, Mass., on Wednesday, October 20th, Dr. Harry E. Sears, aged fifty years.

SIMPSON.—In Banning, Cal., on Wednesday, October 13th, Dr. Jessie Harriet Simpson, of Patton, Cal., aged forty-seven years.

SPAULDING.—In Clifton Springs, N. Y., on Thursday, October 14th, Dr. Francis Wood Spaulding, aged seventy-six years.

SULLIVAN.—At Providence, R. I., on Friday, October 8th, Dr. James E. Sullivan.

Book Reviews

PLASTIC SURGERY

Plastic Surgery of the Face. Based on Selected Cases of War Injuries of the Face Including Burns. With Original Illustrations. By H. D. GILLIES, C. B. E., F. R. C. S., Major R. A. M. C., Surgical Specialist to the Queen's Hospital, Sidcup Surgeon in Charge of the Department for Plastic Surgery, and Late Surgeon in Charge of the Ear, Nose and Throat Department, Prince of Wales Hospital, Tottenham, etc. With a Chapter on the Prosthetic Problems of Plastic Surgery, by Captain W. KELSEY FRY, M. C., R. A. M. C., Senior Dental Surgeon, Queen's Hospital, etc. Remarks on Anesthesia, by Captain R. WADE, R. A. M. C., Late Senior Anesthetist, Queen's Hospital, etc. London: Henry Frowde (Oxford University Press), Hodder & Stoughton, 1920. Pp. xiii-408.

Much credit is due Gillies for the splendid work he has done in plastic surgery. His are the greatest of all contributions to the advance of this interesting reparative work which, we are told, dates back to antiquity. In America his work was first made known to the medical profession through the columns of the *NEW YORK MEDICAL JOURNAL*. Since that time many surgeons recognizing the superiority of this master workman have profited by his methods and given them wide application with excellent results. Now we have his work presented in an admirable form in his new book. Arbuthnot Lane, of intestinal stasis fame, calls our attention to the many fields of usefulness to which Gillies's technic may be applied. He lists ugly scars from burns and accidents, deformities of the nose and lips, harelip and cleft palate, abnormal protrusion or ill development of the mandible, moles, port wine stains. Surgeons know how the lives of many useful people are made ugly by the differences they present on account of various deformities and abnormalities; how they come with their appeals, vainly striving for some help to eradicate the blight which has caused them endless suffering and unhappiness.

Again, burns and accidents require surgical intervention of a plastic nature in order to allow for proper functioning. Cases have been recorded where patients have been fed for years through a tube because of inability to move their jaws. This immobility was caused by adhesions from old scars due to burns or other accidents. Frequently, too, we are called upon to repair a deficiency due to the removal of malignant growths. But why enumerate the many fields of usefulness of this method? They are well known to most of us. Many methods have been tried, but it may safely be said that none compare with the tubed pedicle method of Gillies. The reviewer recalls the crude attempts at facial repair which were attempted in the French army hospitals in the early months of the war. The best of these were poor, very poor, compared with the results obtained by Gillies. Parts of the face were used to repair the face and the process was frequently repeated over the same area in order to secure a satisfactory result. At times the results were fairly good, but the procedure was painfully slow and at best far short of what might be called good. The method of Gillies is so simple and so satisfactory by comparison that it seems strange that it was not thought of earlier.

An interesting historical outline is offered in which we are told of the very early operations in India for the repair of the punitive mutilation of the nose. The forehead flap is the operation which has survived until the present day. Cheek flaps were also used and these survived until fairly recently, but they were finally relegated to limbo. Keegan is praised for his realization of the necessity of a lining membrane for the repair of mucous lined cavities. The method of Tagliacozzi of the two stage operation from the patient's arm to nose goes back to 1415. But the tubed pedicle, the best method known to surgery, was devised by Gillies and he should be given due credit for this excellent idea.

He tells us of the preparatory steps in the conservation of the remaining tissue and various useful little hints for the hastening of recovery; warnings of what should not be done and the harm that may result from the neglect of his injunctions; of the dangers of secondary hemorrhage and how it can be avoided.

The dentist is called in to attend to the toilet of the buccal cavity and to rearrange the bony fragments. Suspensory wiring of fragments is disapproved of on account of having a foreign body in contact with inflammatory bone lesions. Bone grafting, which has been perfected by our own Dr. Albee, is highly recommended. Then come the late repair, the careful planning of the operation; the consideration of the many difficulties which experience has shown we may encounter. A careful selection of the lining membrane is a most important part of the procedure. A modification of the American Esser epithelial inlay, as revised by Waldron, of Canada, and Pickerill, of New Zealand, was used with great success. Then we are shown how every stage of the operation is important, the anesthesia, the prevention of edema, the preservation of the viability of the flaps, the cartilage that must be replaced, and the care of the bone grafts. Every detail is cared for and in every instance simplicity and common sense prevail. The various regions are taken up, every conceivable form of repair being discussed, and every problem that may be encountered is carefully considered. In order to remove the work from the abstract and bring it into the realm of complete reality, many actual cases are given. The photographs and diagrams are all that can be wished for. Finally several civil cases are shown in order that the usefulness of the work may be appreciated in this field. Lane did not mention in his list, the prenatal diseases where the technic could be applied. These include, ectopia vesicæ, hypospadias, meningocele, imperforate anus, and also the various fistulæ so commonly encountered.

Many surgeons the world over will appreciate this monumental work, but the greatest praise will come from those unhappy creatures who, as a result of this new procedure, can again take their place among the unmarked. These unfortunate beings will forever be grateful to their benefactor, H. D. Gillies of London.

MIND ENERGY.

Mind Energy. Lectures and Essays. By HENRI BERGSON, Member of the French Academy, Professor in the College de France. Translated by H. WILDON CARR, Hon. D. Litt., Professor in the University of London. New York: Henry Holt & Co., 1920. Pp. x-262.

"I have sometimes asked myself what would have happened if modern science . . . instead of bringing all its forces to converge on the study of matter, had begun by the consideration of mind—if Kepler, Galileo and Newton, for example, had been psychologists. . . . The most general laws of mental activity once discovered . . . science would have passed from pure mind to life." Bergson confesses to losing himself occasionally for a moment in such a dream to return nevertheless to the practical admission that it could not be otherwise than it is. Even if as much talent and genius had been expended upon mental phenomena as have been "consecrated to sciences of matter." Yet some things would have been found wanting. These are the very intellectual qualities which have been developed through occupation with physical matters and which are quite indispensable as methods of investigation in the mental realm. Bergson is too clear a thinker to proceed, even where the force of his genius directs him, without the precision, exactness, certitude, to adopt his words, which have become the habit of material science. Bergson is a guide whose vision may seem to alight upon mountain peaks which appear unsubstantially above the clouds, but the confidence of the most cautious is assured by his truly scientific attitude. Stimulated by his daring penetration into certain discoverable facts of mind, we can with him "adventure without fear into the scarcely explored domain of psychical realities."

His book *Mind Energy* is a series of lectures and articles given to the world from time to time. They represent the exercise of his thought upon certain often discussed questions regarding the mind, with that deeper entering into such questions which makes Bergson a stimulating leader in the science of mind study. He considers first the definition, rather the nature of mind in its distinguishing manifestation, consciousness. This word does not mean here the mere point of ordinarily recognized awareness. It stands for the entire effort of the mind toward the future through the present, with the entire storing of the past in memory. He describes it as thus conserving all necessary material, and moving on creatively to the new in its relation to life and as opposed to matter. With the latter, however, it has its reaction. The discussion of Soul and Body, in another chapter, that of Brain and Thought, are extensions of such consideration. The study of the experiencing of phantasms and the relation of such a phenomenon to psychic matter yet unestablished naturally follows the line of thought which the first essay introduces. So also does the examination of the phenomenon of false recognition as contrasted with the ordinary process of memory, the sense of having certainly before experienced the matter in question. The discussion of the phenomenon of memory brings forward those illuminating views upon memory and its service in the mental life in which Bergson has already

shown himself an authoritative leader. His carefully expressed reasoning gives therefore peculiar interest to the chapter on Intellectual Effort, where he gives a detailed exposition of the thought process and the sense of effort accompanying it. For in this he shows the method by which thought proceeds not only by darting forward under the inspiration of memory images, but also by working backward among these images for substantiation and adjustment in the mental life already there.

The chapter on Dreams is not a recent enough one to add much that is new. It represents an entrance into the conception of dreams which is growing in acceptance, and forms part of the framework on which Freud's theory rests. A reference to dreams in the chapter on False Recognition reveals even better than the special chapter Bergson's vital appreciation of dream phenomenon.

Bergson is a writer of rare power. His forcefulness is expressed in pregnant words which answer to his intuitive grasp of facts. At the same time he submits these visions of his to careful logical as well as observational testing. There is therefore no page of this small book that is not stimulating to thought. One need not follow him implicitly, not even to await the verification of some things which he claims as "probabilities," but one cannot fail to be roused at least to active questioning and quickened toward the mental processes of life.

HIGH SCHOOL BIOLOGY.

Biology for High Schools. By W. M. SMALLWOOD, IDA L. REVELEY, and GUY A. BAILEY. Illustrated. New York: Allyn & Bacon, 1920. Pp. xxi-590.

Men under thirty can hardly realize how dull and dusty were the scientific paths made in the last century. True, it was a century of magnificent works, high priced, finely illustrated, but the average student could not get these, and the writings were above the comprehension of beginners. There were a few dull volumes in schools sparsely illustrated, but none on biology, so it can be imagined that the book before us would have been eagerly welcomed not only by teachers but by pupils. One great merit is that nothing is left unexplained on the assumption that everyone knows it, and there are excellent references for those who care to know more, as well as Practical Applications, Laboratory Work, Summaries, Questions and Home Work. The first and second sections are on animal and plant biology, followed by one on human biology and a summary and review of general biology. Four hundred and thirty-nine illustrations enliven the way and the derivation of names makes the pupil feel more at home when using long words he comprehends. Nine portraits of men who have helped to smooth the biological path and coax the world to consider its marvels are inserted. It will make youth more just, in judgment, for many insects, animals and plants hitherto deemed evil are shown to be useful and harmless. Naughty Jane, who used to kill flies in our reading primers, is no longer called cruel; the fear of every snake is proved to be senseless. The chapter on forestry and preservation of woods is specially useful today. Community life as seen in nature and among

men, environment, heredity, and variation are also considered and put into simple language. It is only a guess, but the author may be imagined to have wanted to know things in his boyhood and to have had no answers from his elders; hence his anxious effort to make all things clear, in which he certainly has succeeded.

AN ASSORTMENT OF HEALTH.

Health and Social Progress. By RUDOLPH M. BINDER, Ph. D., Professor of Sociology, New York University. New York: Prentice-Hall, Inc., 1920. Pp. i-295.

Take the obverse of the title, Ill Health as an Obstacle to Social Progress, and you would come nearer the correct one for Doctor Binder's book. It is easy to imagine that in his researches the question of disease was a more fertile field than that of health. But the author is an optimist. He will drench you with horrible statistics, then cheer you up with Pasteur and Lister, Reed and Gorgas. His health researches leave no corner of the earth untouched, no peoples, ancient or modern, uncriticized. Ill Health and the Classical World; Health and the Tropics; Health and World Progress, these chapters give some idea of the ground he has trodden. His book has a wonderful amount of information, the result, evidently, of much study, yet it is suggestive of a big exhibition, not quite ready. There is an accumulation of interesting facts which leisure, or lack of power, has failed to arrange in comprehensive order, and the author resembles an eager host, newly returned from a voyage, who urges fresh treasures upon his guest before he has given due attention to those he is admiring. The portion on health and other conditions in cities merits great consideration, and he winds up optimistically with reference to the splendid work done by bureaus of research, amalgamation, of effort, and private benevolence to prepare a fit highway for the goddess of health.

AN UNACADEMIC CRITIC.

Reputations. Essays in Criticism. By DOUGLAS GOLDRING. New York: Thomas Seltzer, 1920. Pp. vii-232.

Reputations are more easily made than demolished—unfortunately. The aroma of success lingers; "lost leaders" are not really lost as soon as they should be. For this reason Douglas Goldring's book should be welcomed by those who wish to do away with false gods. Mr. Goldring has set his face against all forms of tawdriness in art—not only commercialism but the more insidious sins of respectability and middleagedness. H. G. Wells suffers as well as Compton Mackenzie. It is a glorious slaughter—and there is not an epigram in it!

Reputations opens in a noncommittal vein with an appreciation of James Elroy Flecker. Then the author proceeds to evaluate three Georgian novelists—Compton Mackenzie, Hugh Walpole, and Gilbert Cannan, and to appraise Gilbert Cannan as a writer who has not yet found himself but whose work shows the most promise of the three. He praises D. H. Lawrence, though admitting that "frequently his poems are battlefields on which he has been defeated." Arnold Bennet he terms "the Gordon Selfridge of English letters" and "one of the most

brilliant second rate minds which England has produced in the present century." Wells is in danger of becoming a "lost leader"; Wyndham Lewis is irrelevant.

But Mr. Goldring does much more than attack reputations in these papers. He voices the ideals of that keen, ruthless youth which came out of the war determined that the agencies which had wreaked such tragic waste should not have power to do the same thing again. He is for courage and a clean sweep of that which should be swept away. He is quiet about it, but firm. And yet this book is in no sense propaganda. It is the work of a man who does not strive to be literary, who is close to life as well as to books, an unacademic critic. His philosophy can perhaps best be summed up in the goal he sets up for the new criticism—and which he himself so nearly approaches:

"And if we are to have a renaissance of poetry in England we must have a new criticism to meet it—a savage, rasping criticism, speaking with the bitter notes of an idealism which longs passionately for the best, and will no longer tolerate shams. Criticism must once again become the task of those who have an uncompromising standard of values, of those whose love for what is real and sincere will not permit them to deal gently with what is false, pretentious, empty and ephemeral."

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

MAC OF PLACID. By T. MORRIS LONGSTRETH. New York: The Century Company, 1920. Pp. xi-339.

DIE IMPOTENZ DES MANNES. Von Dr. WILHELM STEKEL. Berlin-Wien: Urban & Schwarzenberg, 1920.

DITTE: GIRL ALIVE. By MARTIN ANDERSON NEXÖ. Translated from the Danish. New York: Henry Holt & Co., 1920. Pp. iii-333.

A BIOGRAPHY OF GEORGE MILLER STERNBERG. By His Wife, MARTHA L. STERNBERG. Illustrated. Chicago: American Medical Association, 1920. Pp. ix-331.

THIRTY-FIRST ANNUAL REPORT OF THE STATE HOSPITAL COMMISSION, STATE OF NEW YORK. By Commissioners CHARLES W. PELRGIM, M. D., ANDREW D. MORGAN, and FREDERICK A. HIGGINS. Albany, 1920. Pp. vi-442.

LIFE. A Study of the Means of Restoring Vital Energy and Prolonging Life. By Dr. SERGE VORONOFF, Director of Experimental Surgery at the Laboratory of Physiology of the Collège de France. Translated by EVELYN BOSTWICK VORONOFF. New York: E. P. Dutton & Co., 1920. Pp. xx-160.

TEXTBOOK ON INDIGESTION. By Dr. G. HERSCHELL. Revised and Rewritten by Adolphe Abrahams, O. B. E., M. D. (Camb.), M. R. C. P. (Lond.), Assistant Physician to Westminster Hospital, to the Hampstead and North-Western General Hospital, etc. New York: Longmans, Green & Co.; London: Edward Arnold, 1920. Pp. 228.

HANDBOOK OF PULMONARY TUBERCULOSIS, ITS DIAGNOSIS, PROGNOSIS, PREVENTION, AND TREATMENT. By JEFFERSON DEMETRIUS GIBSON, M. D., Denver, Col., Member of Denver City and County Medical Society; Denver State Medical Association; American Medical Association, etc., etc. Denver: The Denver Scientific Publishing Company, 1920. Pp. 130.

Practical Therapeutics and Preventive Medicine

A Compendium of Treatment and Prophylaxis, Original and Adapted

Intravenous Injection of Iodine in Oil.—Rathery (*Presse médicale*, June 19, 1920); after experiments in animals, administered intravenous injections of iodine in oil in human subjects. The amount of oil thus given was one half to two mils. No discomfort or untoward result was experienced by the patients. After such treatment iodine was still found in the veins twenty-one days after the injection. The resulting prolongation of the therapeutic action accounted for the clinical effects obtained, which were superior to those secured upon administering potassium iodide by the mouth.

Treatment of Syphilis of the Stomach.—G. Leven (*Presse médicale*, June 19, 1920) lays stress on the frequency of incidence of gastric syphilis, having encountered many cases in which an apparently justifiable diagnosis of cancer of the stomach proved erroneous upon antisyphilitic treatment. X ray examination confirmed the cure from specific treatment in these cases. In syphilis of the stomach mercury should be given not only in injections, but also in suppositories and by inunction. Combined administration of iodides or other iodine compounds is likewise indispensable.

Treatment of Disorders of the Spinal System by the Intraspinal Method.—F. J. Farnell (*Journal of Nervous and Mental Disease*, May, 1920) says that the extradural space containing great amount of areolar tissue, which is well vascularized and contains many lymphatics, was utilized for treatment of disorders of the spinal system according to this method. This was in order to avoid the two usual obstacles in the way of those seeking treatment for spinal disease, i. e., puncture headache and loss of time from work by keeping to one's bed. Salvarvanized serum was injected into the extradural space, and removal of spinal fluid thus avoided. Excellent results were obtained, both by avoidance of untoward afterresults and for the improvement of the condition for which the patient sought treatment.

Therapeutic Pneumoconiosis in Pulmonary Tuberculosis.—E. A. Sevilla (*Plus-Ultra*, Madrid, April-May, 1920) states that a careful investigation of the action of artificial pneumoconiosis in the prevention and treatment of pulmonary tuberculosis justifies the following conclusions: 1. The inhalation of insoluble powders tends to promote healing of tuberculous lesions in the lung. 2. This absorption is brought about by an increase in the defensive cells. 3. These powders when combined with an antiseptic constitute a measure of applying antiseptics to the lung tissues. 4. There results a sclerosis of varying degree in the lung, which acts as a protective barrier. 5. Insoluble powders are convenient vehicles for the application to the lung lesions of antibacillary products of varying origin and nature, such as tuberculins, antiseptic substances, and desiccated sera. 6. This measure of therapy is capable of exerting a topical action in diverse localized pulmonary affections, such as gangrene and actinomycosis.

Opium in Acute Dilatation of the Heart.—Diego. T. R. Davison (*Semana Medica*, June 3, 1920), in reporting a case in a girl of twenty, draws attention to the fact that opium has no depressant action on the heart and that it acts beneficially in these cases of acute dilatation by quieting the accelerator nerves which by their overaction are weakening the myocardium. Rest in bed is essential, of course, for the return of the heart cavities to normal. Digitalis has been found to be of no avail in these cases either during the acute stage or later during the period of recuperation. He prefers to build up the heart muscle indirectly with arsenic and the hypophosphites.

Treatment of Rheumatism and Gout by Hypodermic Injections of Salicylic Acid.—M. J. Sejournet (*Semana Medica*, June 3, 1920) states that for the past twelve years he has treated articular rheumatism and gout by the subcutaneous injection of a three per cent. solution of salicylate of sodium. However, he found that this procedure was quite painful and he turned to the solution of salicylic acid in a strength of one in one thousand, which he injected under the skin in the neighborhood of the affected joints. Even here he found it necessary in some cases to precede the treatment with a local anesthetic. His results were so uniformly good that this has become the method of choice with him.

Effect upon Blood Pressure of Adrenalin Injections in Dementia Præcox.—Lawson G. Lowrey (*Boston Medical and Surgical Journal*, August 12, 1920) says that an analysis of the blood pressure reactions to the injection of adrenalin in seventy-eight psychopathic patients makes it clear that such an injection does not have the value in differential diagnosis which has been claimed for it, at least in early cases, since some cases of præcox show a rise and others show a fall. In fifty-four out of sixty cases of dementia præcox there was an increase in blood pressure, forty of these showing a rise of more than five mm. Hg. In eighteen cases of other types taken for comparison there was a depressor reaction in four.

Convulsive Disturbances Cured by Surgical Operations.—P. Bazy (*Bulletin de l'Académie de médecine*, June 1, 1920) reports a case in which convulsive seizures simulating epilepsy disappeared after an operation for appendicitis in a young man eighteen years of age. The manner in which the convulsions were relieved is believed to have been similar to that in which convulsive seizures in another young man who had been taking a too exclusive meat diet disappeared when a more vegetarian diet was prescribed. Two cases of convulsions accompanying undescended testicle are also reported, in which relief occurred after operation for the testicular malposition. Such convulsions are not, of course, to be held as manifestations of actual epilepsy, even if preceded by an aura. In one of the cases of testicular ectopy referred to, pain at the site of the misplaced organ was a distinct feature.

Action of Gum Acacia on the Circulation.—W. M. Bayliss (*Journal of Pharmacology and Experimental Therapeutics*, March, 1920) found, in extensive experimental work, that a solution of gum acacia of six to seven per cent. in 0.9 per cent. sodium chloride solution is capable of effectively replacing blood lost, unless the loss exceeds seventy-five per cent. of the blood volume. Hence its use in hemorrhage due to various causes. Its effect is due to the fact that the blood vessels are impermeable to colloids, so that their osmotic pressure is effective in retaining within the circulation the solution injected. It has no chemical or drug like action and can be used in large quantities. It can also be used with benefit when the blood volume is reduced owing to removal of a part of the blood from effective circulation by stagnation in the capillaries, as in wound shock and traumatic toxemia. In such cases, its primary object is to maintain a normal circulation until the toxic products are eliminated from the blood, while the blood out of circulation is restored to use. When fluid has escaped from the blood owing to the capillaries becoming permeable to colloids, as in the action of tissue toxins, gum saline restores the normal state provided the morbid condition has not lasted too long; if it has, even blood transfusion is of no avail. When the blood has become concentrated by loss of fluid from the body, gum saline is more effective than saline solution alone, even if hypertonic, since it is not so rapidly lost from the circulation. Gum saline has also proved of value in toxic anemia, e. g., in blackwater fever. Neither gum nor blood transfusion has any permanent effect when the blood vessels are deprived of control by the vasomotor centres. Gum acacia does not produce anaphylaxis nor hemolysis. It does not agglutinate the blood corpuscles in man.

The Phenolsulphonephthalein Test and the Nonprotein Nitrogen of the Blood in Chronic Nephritis.—Reginald Fitz (*Boston Medical and Surgical Journal*, August 26, 1920) presents the following conclusions: The phenolsulphonephthalein test and the nonprotein nitrogen concentration of the blood are two tests for kidney function which are being generally used for the diagnosis, prognosis, and treatment of chronic nephritis. These tests are not of obvious value in the diagnosis of chronic nephritis, as they do not point out the presence of any specific pathological type of lesion in the kidney and do not demonstrate the presence of kidney disease in the absence of common physical signs. From a pathological point of view there are two common types of chronic nephritis. The essential lesions of chronic glomerulonephritis are found in the glomeruli and of arteriosclerotic nephritis in the smaller renal vessels. Clinically both types of chronic nephritis are usually associated with cardiac hypertrophy, increased blood pressure and eye ground changes, and with a urine which contains albumin, blood, casts, or leucocytes. Both types of disease are chronic and slowly progressive. Chronic glomerulonephritis is a disease of young people. Arteriosclerotic nephritis may appear in young people, but is more often found in older people. The clinical differentiation of these types

does not depend upon studies in renal function, but upon careful history taking and routine physical examination. As the lesions of chronic nephritis advance, the phenolsulphonephthalein excretion diminishes and the nonprotein nitrogen concentration of the blood increases. At present, however, a single observation with these tests gives less prognostic information than does careful clinical examination. The present treatment of chronic nephritis is largely empirical. The phenolsulphonephthalein test and the nonprotein nitrogen concentration of the blood offer means by which physiological methods may be applied to the clinical study of individual cases. Unless the technic of these tests is properly controlled, the interpretation of their results is of little value. When these tests are properly performed, they can be used to assemble facts from an individual case which measure the progress of the disease in more or less quantitative fashion, and which make possible the establishment of a logical and systematic form of treatment.

Treatment of Human Anthrax by Normal Bovine Serum.—J. Penna, J. B. Cuenca, and R. Kraus (*Monografias del Instituto Bacteriologico del Dept. Nacional de Higiene*, Buenos Aires, January, 1920) report three hundred and eighty cases of anthrax treated with normal bovine serum with a mortality of six and two tenths per cent. They found that the normal serum was quite as efficient as the serum of animals immunized against anthrax by inoculation; furthermore they verified their former findings that serum sickness does not result from the use of bovine serum heated twice to 56° C. They also proved that the mixture of bovine serum with horse serum prevented the serum sickness which so often occurs when the latter is used alone. They used in severe cases intravenous injections of from thirty to fifty c.c. of the normal bovine serum every twenty four to thirty six hours up to a maximum of two hundred and fifty c.c. In mild or benign cases intramuscular or subcutaneous injection sufficed.

Autohemotherapy in Protracted Infections.—G. Mouriquand (*Lyon médical*, June 10, 1920) notes that some acute infections, having passed into the subfebrile stage, persist for weeks or months, as though vaccination of the patient's system could not be brought to a conclusion. Such dragging infections seem in some respects comparable to cases of pleurisy with delayed absorption, in which Gilbert has recommended autohemotherapy to initiate absorption of the fluid. A case of peliosis rheumatica is reported in which this procedure was applied, apparently with complete success. The patient was a wet nurse aged thirty years, who had been suffering for six weeks from joint involvement and erythema multiforme, which resisted salicylates and aspirin, and recurred every two or three days. The temperature had hovered about 38° C. throughout the six weeks. Four mls of the patient's own blood, collected in citrate solution, was then injected into the subcutaneous cellular tissues. On the next day the temperature descended to normal and joint and skin manifestations completely disappeared. Three weeks later they had not yet returned.

General Anesthesia.—Alberto R. Egana (*Se-mana Medica*, April 29, 1920) in an extensive consideration of the subject arrives at the following conclusions: 1. Minor surgical operations or those on the extremities are best done under nitrous oxide oxygen. 2. For all operations requiring complete muscular relaxation, especially in abdominal surgery, the nitrous oxide ether sequence is the method of choice. 3. Chloroform is too dangerous for general use, but it may more safely be mixed with ether. 4. The open method of giving ether is always to be preferred. 5. Intratracheal insufflation is of value for thoracic operations. 6. Rectal anesthesia with ether in five per cent. oily solution is suited to operations on the head and neck combined with local anesthesia. 7. Morphine and atropine injections are to be used systematically.

Local Anesthetic Action of Saligenin.—A. D. Hirshfelder, A. Lundholm and H. Norrgard (*Journal of Pharmacology and Experimental Therapeutics*, June, 1920) report experimental and clinical studies on saligenin—salicyl alcohol—and other phenyl carbinols as local anesthetics. Saligenin proved the best of the entire series of phenolic alcohols investigated. It has the lowest toxicity, the least tendency to form wheals or edema, and the highest selective action in blocking the sensory nerves. The anesthesia was found to last longer than with procaine or benzyl alcohol. In tonsillectomy anesthesia with two per cent. saligenin solution uniformly proved as satisfactory as that with 0.2 per cent. procaine. Two sebaceous cysts were removed by Stratte under two per cent. saligenin, ingrowing toenail operations performed under it by Stratte and Robitshek, an inguinal hernia dealt with satisfactorily by Tinker under one per cent. saligenin, sensory block of the mandibular nerve for over fifteen minutes obtained in two cases by Schien with a four per cent. solution, and a like solution used with success for cystoscopy by Wynne.

Herpes Iris.—A. J. Chalmers and Norman Macdonald (*Journal of Tropical Medicine and Hygiene*, June 15, 1920) note that the present tendency is to look upon all forms of erythema multiforme, including herpes iris, as being due to anaphylaxis caused by the absorption of some chemical product from the intestine or other passages, or from a diseased organ. The success of treatment by intestinal antiseptic therapy in certain cases offers some support to this theory. The essential features of herpes iris are the central vesicle or bulla, the surrounding ring of vesicles, the affection of the lips and mouth, the formation of several rings of vesicles outside the first; the slight constitutional disturbance, and the tendencies to recur if not properly treated. It is differentiated from its nearest ally, erythema iris, by the fact that in the former there is a vesicle surrounded by an erythematous blush. The first aim in the treatment should be to find the site from which some form of chemical absorption is taking place. In one of the author's cases the intestinal tract appeared to be the only possible source of trouble; the patient was placed in bed on restricted diet and given purgatives and salicin, with immediate and excellent results.

New Method of Preventing Anaphylactic Manifestations.—Kopaczewski (*Presse médicale*, June 16, 1920) has shown experimentally that anaphylactic manifestations can be obviated in animals by injecting chloroform or ether in amounts insufficient to produce anesthesia. The widely accepted theory of the important rôle played by the nervous system in anaphylactic shock is thought to be weakened by these observations. Since general and local anesthetics possess to a marked degree the property of reducing the surface tension of the blood, and since this property is also known to be the powerful factor preventing precipitation of colloids—and therefore precipitation of the blood—the author is led to consider anaphylaxis simply as a precipitation of the colloids of the blood. The precipitate formed blocks the capillaries and thus causes sudden and grave asphyxia. Widal's labors have shown that many disorders are associated with anaphylactic manifestations, e. g., asthma, hemoglobinuria, urticaria, the diathetic and dyscrasic affections, eclampsia, and serum disease.

Diagnosis and Treatment of the Hemorrhagic Diseases.—Ralph C. Larrabee (*Boston Medical and Surgical Journal*, August 5, 1920) says, concerning the treatment of these diseases, that local applications are not satisfactory. The older astringents and styptics, such as ferric chloride and alum, do little but make a nasty mess. Epinephrine solutions will often control slight bleeding from the mucous membranes, but their action is quite fleeting. Cephaline, coagulen, coagulose and other tissue extracts are of somewhat greater value locally, both in platelet cases and in hemophilia, but appear to be ineffectual when used intramuscularly or intravenously, while the possibility of producing emboli would seem to make the intravenous use inadvisable. Calcium salts are of value only where the hemorrhagic tendency is the result of calcium deficiency. In such cases, when an operation is contemplated, calcium lactate should be given in large doses by mouth for several days, and operation should be deferred until coagulation time is normal. Fresh animal serum contains prothrombin, which is absent in hemophilia and hemorrhagic disease of the newborn, but this disappears in a few hours and old serum is worse than useless. Fresh serum does not contain platelets, so can be of no value in hemorrhagic purpura and other diseases where the bleeding is due to platelet deficiency. The value of diphtheria antitoxin rests wholly on empirical grounds. Theoretically and experimentally serum is of little value. The intravenous administration of whole blood comes nearer to being a universal panacea in this group of diseases than any other procedure. It is the method of preference except in chronic obstructive jaundice, where calcium is better. Either the citrate or the parafined tube method may be used. He prefers the latter because the citrate method causes more reaction and introduces fewer platelets. When facilities for intravenous transfusion are lacking, rapid intramuscular injection of small amounts of human blood may be used, preferably in tissues near the bleeding area; especially good results have been reported in purpura hemorrhagica.

Proceedings of National and Local Societies

MEDICAL SOCIETY OF THE STATE OF NEW YORK

*One Hundred and Fourteenth Annual Meeting,
Held in New York, March 23 to 25, 1920*

The President, Dr. CLAUDE C. LYTLE, of Geneva, in the
Chair.

(Continued from page 652)

The Rôle of the Colon Bacillus in Infections of the Kidney.—Dr. EDWIN BEER, of New York, in a further discussion of the subject, asked whether Dr. Cabot was of the opinion that preliminary vaccination prevented complications with the colon bacillus following prostatectomy and requested him to discuss the question of ureteral catheter lavage of the pelvis of the kidney. Personally he had seen absolutely no results from this procedure. In cases of acute pyelitis naturally one did not care to irrigate the pelvis of the kidney, but there might be some benefit from washing out the ureter and thus cleaning out mucus plugs that were causing some interference with the outflow of urine. The reason they did not get results by this procedure was that they did not know what they were treating. The only diagnosis made was made after pus had put in its appearance. The diagnosis of kidney involvement was not made until after the fifth day. He did not believe lavage was effective. With the patient in the Trendelenburg position the silver nitrate might go to the pelvis of the kidney, but he doubted if it reached the foci of infection in the parenchyma.

Dr. Cabot said the question he had wanted to hear discussed was the possibility of the sensitization of the kidney with foreign protein. Dr. Keyes had asked a question which he could not answer. It was, however, beyond doubt that occasionally there was a case in which the use of the ureteral catheter with or without lavage of the kidney had produced spectacular results. He could not subscribe to the theory of stricture of the ureter. These cases did not occur in his experience. He had been asked whether he had retreated from his position in regard to certain anatomical relations which might account for the frequency of pyelitis in little girls. The difficulty here was that there had not been produced a sufficient amount of good work to settle the question one way or the other. Dr. Grimes and he had studied the length and position of the large intestine in females as compared with males; it was possible that there was a definite anatomical difference but it had not been shown thus far. As to the relation of the intestines to the kidney, he did not agree with Dr. Brasch. The relation between the intestine and the kidney was clear. He had a series of twenty-five men between the ages of twenty-five and thirty-five years whose urinary tracts were sound, men in good circumstances and living out of town, who had had acute illness characterized by fever and diarrhea and evidence of acute colitis, and it was observed in a few days that colon bacilli were passed in the urine. In many cases the colon bacilli disappeared from the urine, but later the patients would have another

acute attack, with symptoms of kidney infection, fever and bacilluria. The relation between pyelitis and ulcerative colitis was often striking. Dr. Brasch had laid a good deal of stress on the importance of the removal of focal infections elsewhere in the body. Such infections were occasionally due to the colon bacilli but they were oftener due to the streptococcus group; the condition he was talking about had nothing to do with that, for he did not believe that the streptococcus produced pyelitis. He believed in a search for focal infection, but he doubted that there was a connection between colon bacillus infection of the kidney and infections of the mouth and teeth. Silver nitrate might affect the organisms in the superficial epithelium and even release organisms deeper down, but he doubted whether silver nitrate did more than ameliorate symptoms. Unless the colon bacilli were permanently eliminated the patient did not stay cured. In the group of little girls he should hesitate to use the cystoscope or to catheterize the kidney; he did not believe local treatment would be of much help in this group. He was inclined to believe their hope lay in vaccines, but here the difficulty was that there was no measure of immunity and we did not know whether immunity was produced by vaccines. There were many strains of colon bacilli and it was not known whether vaccination against the strains that were producing the pyelitis could produce an immunity against those organisms.

SYMPOSIUM ON ENDOCRINE DISEASES.

Disturbance of Internal Secretions of Sex Glands.—Dr. WILLIAM C. QUINBY, of Boston, discussed the clinical and experimental evidence of function of the gonads, that is, the sex glands, and showed instances of disturbed function. The spermatozoa and ova might be considered analogous to external secretion of other glands of the endocrine system. The testicles and ovaries had a definite internal secretory function the products of which so far had not been isolated as definite chemical products. A hypothetical substance called spermin had been isolated but that was entirely impure and had no value. In the male the endocrine portion of the testis was situated in the interstitial tissue or the cells of Leidig. These cells lay between the tubules and showed different degrees of development. In the female the endocrine function was subserved also by interstitial cells and probably further by corpora lutea, but certainly before menstruation occurred the action of corpora lutea was not present. The evidence showed definitely that the internal secretion of the gonads caused the appearance of the secondary sexual characteristics. The term originated with John Hunter. Those secondary changes were the changes occurring at puberty. Certain experiments, especially those of Steinach, showed the great importance of the internal secretion of the testicles and ovaries. Steinach laid so much importance on this interstitial tissue that he named it the puberty gland, indicating that puberty depended entirely upon its action. By experiments on animals he showed that these secondary sexual characteristics could be produced. Thus male rats

which had been castrated before puberty and in whom an ovary had been transplanted took on secondary female characteristics; the same was true of rats of the opposite sex. We did not know the stimulus that called into activity this property of the gonads. It might depend on the interactivity of other endocrine glands—for instance, the hypophysis. Gonadal stimulating properties might exist in all endocrine glands. We should find clinical cases in man showing the results of hyperfunction or hypofunction of these organs; that is, we should find cases of precocious or delayed puberty in both sexes. We could also study the effects of double ovariectomy.

Mild Types of Thyroid Toxic Adenomata.—Dr. MALCOLM S. WOODBURY, of Clifton Springs, said there were two varieties of goitre which might be toxic—the exophthalmic type and toxic adenomata. The opinion was that adenomata were embryological in origin, derived from fetal rests. Work was being done on this and would be published soon. For the clinician it was important to recognize that adenomata might appear as distinct nodules or there might be a diffuse process, as shown by the microscope; the absence of nodules did not rule out this condition. The recognition of thyroid adenomata as an entity marked an advance. They might attain a large size, but usually not without toxicity. The mild ones might produce only pressure symptoms. Small adenomata might be toxic just as small exophthalmic goitres might. Plummer stated that thirty-three per cent. of all hyperfunctioning thyroids were adenomata. It was obviously of the greatest importance to differentiate toxic states associated with goitre from psychoses. The term thyrotoxicosis was better than the term hyperthyroidism when applied to adenomata. In our recent short series there was a family history in eighty per cent. of the cases and infections of the tonsils or teeth in ninety per cent.; all the patients came from districts in which goitre was rather common. Probably the etiology was somewhat as follows: It appeared that fetal rests might be transmitted more commonly in certain families; be due to the water content in localities requiring an overactivity of the thyroid in metabolism adjustment, to disturbance of the sympathetic nervous system, or to pregnancy. The cells proliferated and took on the form of adenomata. Whether the activity was due to cells in the adenoma *per se* or the surrounding cells was not yet established. Nervous symptoms in the cases of adenomata were no different from those in the exophthalmic cases. In adenomata fifty per cent. of the patients complained of depression which was different from the depression of psychoses in the absence of selfaccusatory delusions. Definite nodules could be felt in half the cases, although palpation must be done carefully to detect them. Dr. Woodbury described his method of palpating the thyroid to detect adenomata. With the patient sitting with the head on a head rest turned toward the side on which the examiner stood, the landmark to palpate was the oblique ridge on the alæ of the thyroid cartilage when the patient swallowed.

The metabolism rate had received a great deal of attention since the portable apparatus of Benedict had come into use, but too much reliance must not be placed on it and it was necessary to allow for differences in weight, age and sex. An increase of not more than fifteen per cent. was to be considered normal. Adenomatous cases might show only a slight increase in basal metabolism or no increase at all, and the question arose whether these were cases in which a toxic element was playing a part. Dr. Woodbury thought they were. The Goetsch test was positive. The patients were operated on by Dr. C. W. Webb, with good results where the gland was available for operation. The Goetsch test had distinct value in the diagnosis. One point to be emphasized was that solutions of adrenalin chloride varied a great deal according to the age of the solution. This ought to be taken into consideration. Folin had described a test for determining the purity of adrenalin. Dr. Woodbury did not regard the Goetsch test as positive unless there was a rise of over ten points in blood pressure together with subjective symptoms, including tremor. One is hardly justified in ruling out all thought of a thyrotoxic state because the basal metabolism according to our present methods ran within normal limits. It seemed that cases occurred in which there was no definite rise. The Goetsch test was not an absolutely reliable criterion. Certainly for the diagnosis of mildly toxic cases of adenomata study of the individual patient must be made and all available points of diagnosis utilized.

SYMPOSIUM ON GASTROINTESTINAL DISEASES

Practical Clinical Laboratory Diagnosis in Gastrointestinal Disease.—Dr. HOWARD F. SHATTUCK and Dr. JOHN KILLIAN, of New York, prepared this paper, which was read by Dr. Killian. They stated that some of the new methods of examination, particularly the x ray, had lessened the use of chemical examinations or rendered the consideration of them less important, yet they often yielded findings in clinical problems where every bit of evidence was needed. In a series of examinations made at the Postgraduate Hospital the authors were impressed by the great amount of free hydrochloric acid in cases of gastric ulcer as compared with duodenal ulcer. The average per cent. of free hydrochloric acid was under 0.50 in cases of duodenal ulcer, while it ranged from 0.53 to 0.80 per cent. in cases of gastric ulcer. In carcinoma of the stomach the average percentage of the free hydrochloric acid was very much under 0.50, reaching that figure in only one instance. A large group of miscellaneous conditions yielded results in which the total percentage of free hydrochloric acid was under 0.50. A second interesting point was the association of hydrochloric acid and lactic acid in cases without retention. It was common to find lactic acid in the gastric contents with retention, and rarely was lactic acid present without retention.

In regard to the value of the Wolff-Junghans test: Smithies reported that next to the Boas-Oppler bacillus a positive Wolff test was the most frequent finding in gastric cancer. This test was positive in eighty per cent. of the cases; lactic acid

was present in seventy-five per cent.; the Boas-Oppler bacillus was present in ninety per cent. In the authors' group of cancer cases eighty per cent. gave a positive or suspicious Wolff test. The test had been of value in distinguishing the malignant from the benign achylas. The records of gastric cases had brought out the great value of gastric analysis in the differentiation of true achylas from psychic achylas. In none of the cases of true achylia gastrica or pernicious anemia were they able to demonstrate the presence of free hydrochloric acid at any time in the digestive cycle. There were cases simulating true cases which proved on examination to be spurious or psychic achylas. In these cases improvement was obtained by the use of hydrochloric acid.

As regards enzyme activity of the duodenal contents, Einhorn had shown the value of this procedure in pancreatitis. It gave qualitative rather than quantitative results. The duodenal contents were obtained by any of the duodenal tubes after test meals and removed at intervals. In thirty-one cases, the pancreatic enzymes were present except in the cases of pancreatitis, in which the protease was absent and the lipase present in small amount.

What the authors wished to emphasize from the data obtained was the proportion of the total acidity in the form of free hydrochloric acid. In a series of normal cases they found that the free hydrochloric acid formed about forty per cent. of the total acid in the Ewald meal and about thirty per cent. in the retention meal. It was always less than fifty per cent. In a series of cases of gastric ulcer they were impressed with the fact that the total acidity was never very high. In only two cases was there marked hyperacidity. The constant feature of these gastric ulcers was that the proportion of the free acid to the total was always greater than fifty per cent. and in most cases it approached seventy-five per cents. That was true of the Ewald meal. In the retention meal the percentage of free hydrochloric was even greater. The secretion of hydrochloric acid seemed to be free from the stimulus of food. In a series of duodenal ulcers divided into two groups, postpyloric and other types, in the postpyloric the total acidity and the free acid were relatively high, and the percentage of free acid was greater than fifty per cent.; it was similar to the condition in gastric ulcer, but in the retention meal the percentage was less than in the Ewald meal. In none of these cases of postpyloric ulcer were there evidences of retention and in none was lactic acid found. In the other type of duodenal ulcer the percentage of free acid did not exceed fifty per cent. and in the retention meal it ranged from zero up to thirty-two per cent. In gastric carcinoma the free hydrochloric acid ranged from zero up to forty, and in the retention meal it ranged from zero up to twenty. In these cases there was free hydrochloric acid.

In normal cases the average percentage of free to total acid was forty following the Ewald test meal. In gastric ulcer the proportion of free to total was greater in the retention meal than in the Ewald meal. In postpyloric ulcers the percentage of free hydrochloric acid was not as high as in gastric ulcers after the retention meal.

So far as examination of the feces was concerned, there were two factors; one was the diastase activity of the stool and the other was the presence of occult blood. In the diastase the normal activity of the stool varied from twenty-five to thirty per cent. When stools were incubated with starch thirty per cent. of the starch was converted into sugar. In diseases of the pancreas the diastase activity of the blood was increased, whereas the diastase activity of the stool was either absent or greatly decreased.

Practical Clinical Examination of Upper Gastrointestinal Tract.—Dr. ALLEN A. JONES, of Buffalo, presented a tabulation of diseases most commonly encountered. In gastric and duodenal ulcer, pain was one of the most important manifestations. Many times in young women the first symptom was hematemesis. He had noticed pain to be more frequent in men than in women. Pain was relieved by digestion, and it supervened sooner after eating in gastric than in duodenal ulcer. If the ulcer was located far back postprandial pains occurred; the pain was intermittent in cases with peristalsis. Typical hunger pain usually felt as a gnawing, was strongly indicative of duodenal ulcer. The pain of gastric and duodenal ulcers was temporarily relieved by alkalis. Pain simulating hunger pain might arise from extragastric conditions. Vomiting or lavage relieved the pain of ulcer but not the pain from extragastric conditions. In perforation the pain was excruciating and prostrating and was accompanied by increased frequency of the pulse and muscular rigidity; a leucocytosis was found soon after perforation occurred. Pain in the back at or near the tenth dorsal vertebra was an important symptom, as it indicated ulcer on the posterior wall of the stomach. Tenderness due to ulcer was usually present in some part of the epigastric region. A full stomach gave rise to tenderness. Vomiting was not common in ulcer unless stenosis existed. Hematemesis was one of the classical symptoms of ulcer. In some cases of ulcer with hyperesthesia vomiting was present. Fever might be present if there was suppurative peritonitis. Anemia was common in gastric ulcer.

The most important symptoms of cholecystitis and cholelithiasis were the irregular temperature, pain, and tenderness in the region of the gallbladder. Suppurative cholecystitis might be suspected if there was a decided leucocytosis. If cholangitis accompanied cholecystitis there was evidence of some degree of jaundice. In rupture there were tenderness over the liver, rising pulse, and shock. The symptoms of cholelithiasis often occasioned confusion. This affection was often painless and the symptoms might be gastric. Some sensory gastric disturbances might be present. Tenderness over the liver was a varying factor, which might be elicited only on pressure or by Murphy's hammer stroke over the liver. Pyloric spasm, turbid bile withdrawn through Einhorn's tube, and traces of bile in the urine were not infrequently found in gallbladder disease.

Acute gastritis with its distress after eating should be remembered as a cause of sudden pain in the upper abdomen.

(To be continued.)

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THE ENDOCRINES IN GYNECOLOGY.

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In writing a paper on the endocrines in gynecology I am confronted with two alternatives, one of which is to prepare a general review of the subject; the other is to confine myself to those phases of it to which my personal interest and work have been especially directed. A comprehensive presentation of the entire subject in a brief review is a difficult task, and one which has been so notably well performed in a recent article by Dr. Bandler, that I feel that any attempt at repetition on my part would be of little value. I shall, therefore, restrict myself to a discussion in some detail of two topics which have seemed to me to be of especial importance in gynecological endocrinology. They are, first, the relationship of the endocrines to the specific neuroses of patients suffering from pelvic disease; and, secondly, the histogenesis and function of the internal secreting cells of the ovary.

THE NEUROSES.

No one can practise the science of gynecology long without becoming impressed with the extreme importance of the nervous element in the symptomatology of his patients. In order to give some definite figures to illustrate this point I have reviewed the consecutive histories of one thousand private patients and find that in 837 or 84 per cent. nervousness is a more or less serious part of their complaints. In a considerable number of cases it appears as the most prominent symptom, for which the patient seeks relief.

Although in employing the term nervousness one is dealing with a very loose expression, nevertheless popular usage, both among the laity and the profession, has confined its meaning to rather definite limits. Thus a patient who states that she is extremely nervous is describing a symptom that to her is entirely specific, and one which to the physician is perfectly intelligible. To the term nervousness, however, it is almost impossible to give a strict definition on account of its well nigh limitless manifestations. We are, in the present discussion, not so much concerned with the various phases of nervousness as with the underlying conditions that cause it. We shall use the expression in its popular sense and direct our attention only to those cases in which the symptom nervous-

ness may be regarded as a functional disturbance. We shall leave out of the discussion altogether those cases in which the nervous symptoms indicate some essential mental deviation.

Functional nervousness may be constitutional or acquired. By constitutional we mean a neurotic habit which is either the result of an unstable nervous inheritance, or one which has been fixed during childhood, or one in which both factors have played a part. By an acquired neurosis we mean one which, appearing after the complete formation of character, may be referred to some intercurrent physical disability, such, for example, as a pelvic lesion.

The excellent work of the psychoanalysts has taught us much concerning the constitutional neuroses. From Freud we have become acquainted with the great field of unconscious thought, and learned the influence of childhood fixations on future character. Sidis, though not a psychoanalyst, has demonstrated the importance of fear in the production of neuroses. Adler has traced the neurotic constitution to the sense of inferiority induced by congenitally deficient organs. The psychoanalysts, however, have paid little attention to the specifically acquired neuroses that are of especial interest to the gynecologist, nor have they given due consideration to the important rôle played by the internal secretions in all emotional and affective states. The gynecologist is therefore thrown to some extent on his own resources in estimating the cause, character and therapeutics of those neurotic conditions which he as a specialist is called upon to treat.

You will doubtless agree that the condition popularly called nervousness is, irrespective of its cause, an emotional state, and that this emotional state is always associated with certain physiological body changes whether the inciting cause of the emotion be some acute mental excitement or a chronic physical disability, or a subconscious mental repression. In order to understand this statement fully it is necessary to have in mind a clear conception of the term emotion.

Emotions were formerly regarded as purely mental states which gave rise to specific bodily expressions, as for example, anger, fear, joy, and many others. It was common to regard them as definite psychic attributes, component parts, as it were, of our mental equipment, just as our organs of sense or limbs are parts of our physical ap-

paratus. William James was perhaps the first to emphasize the idea that emotions are not themselves psychic states but are physical sensations resulting from actual bodily changes. Thus he says that "our feeling of the bodily changes that ensue after the perception of an exciting fact is the emotion" and invites us to imagine ourselves as being angry, for example, from a purely intellectual viewpoint, eliminating entirely our bodily sensations. James, unfortunately, knew little of the glands of internal secretion, and therefore was unable to describe completely the physiology of those bodily changes to which he referred in his description of the emotions. His theory of the emotions, however, has received remarkable confirmation from the researches of scientific physiology. Animal experimentation has shown that during emotional excitement such as that induced by fear, anger, pain and hunger, there is a markedly increased production and absorption in the blood of adrenalin. Cannon has demonstrated the reciprocating action between adrenalin and the sympathetic nervous system, by which certain bodily changes such as an increase of respiration and pulse beat, inhibition of the digestive secretions and an increase in the production of adrenalin are maintained during emotional states. He has proved that the action of adrenalin on the general organism when artificially introduced into the circulation is precisely that of the sympathetic nerves. In other words, the sympathetic system provides the organism with a material which by its presence in the blood automatically prolongs the effects which the stimulated nerves initiated.

This reciprocating mechanism, as Cannon states, is undoubtedly a provision of nature to stimulate the organism to a higher degree of motor activity for combat and defense. It may readily be imagined, however, that these bodily changes which are of immense benefit to the individual in a temporary crisis, may under the influence of constant stimulation become a serious detriment to health. And this is precisely what happens in the case of the neurotic in whom some unremitting physical or mental irritation maintains a state of continuous emotional excitement.

The scientific discoveries of the physiologists introduces into psychology a new factor of great interest since they prove beyond dispute the influence on the organism during emotion, not only of the sympathetic system of nerves, but also of the glands of internal secretion. Accurate experimentation has been carried out along these lines chiefly with the secretion of the adrenal gland. Nevertheless from our knowledge of the intimate interrelationship that exists between all the endocrines it is entirely probable that the adrenal gland is not the only one that takes part in producing the sensations of the emotional states. In fact this is sufficiently evident from the observation of patients who suffer from diseases of the internal secretory glands, examples of which are the emotional excitability of persons with organic hyperthyroidism, and the mental dulness of those affected by the opposite condition, the exaltation of the bodily and mental functions seen in those with early pituitary

disease, and the premature decay of the same functions as the disease progresses, and finally the marked dispositional changes in those who have undergone early castration.

Just what part the individual glands take in the emotions must at present remain a matter of speculation. Next to the adrenals, one would expect the thyroid to be the most important. The nervous manifestations of pathological hyperthyroidism are so well defined that not infrequently in the reactions of functionally nervous patients one recognizes symptoms of an unmistakably hyperthyroidal character. Furthermore we know that the adrenals and thyroid are rather closely and harmoniously related in their physiological properties. During sexual emotion it seems evident that all the glands of internal secretion become active. Of these it is probable that the adrenals, thyroid and pituitary play the most important rôle, the ovaries apparently being of minor significance.

With this brief survey of the subject we are justified in describing functional nervousness as a continuous state of emotional excitement, sensory in character, and induced by the reciprocal action, under stimulation, of the autonomic nervous system and certain glands of internal secretion. This definition is incomplete in that it leaves out of account the element of causation, and to this we must now direct our attention.

We have already referred to the lessons that we have learned from the psychoanalysts. To Freud is due the lasting credit of proving the enormous influence on character and behavior of unconscious repressions. In attempting, however, to apply his libidinal theory of causation to the specific gynecological neuroses we at once meet with serious obstacles. It is indeed true that the gynecologist encounters numerous sexual neurotics who are suffering from pelvic disease and in some cases the pelvic lesion bears some causal relationship to the neurosis, but to attribute all female nervousness to sexual repression is an absurd fiction, requiring as it does an acceptance of the untenable doctrine of the extreme Freudians, that the libido in its literal sense is the basis of all human motivation. I have in other articles called the attention of gynecologists to the theories of Alfred Adler and shown how they may be applied to the subject in hand. Adler in brief explains the neurotic constitution on the ground of a sense of inferiority resulting from organ deficiency. He ably and convincingly deals with the confirmed neurotic whose constitutional habit has been established at an early age. The sense of inferiority continues as an unconscious repression in the Freudian sense and may or may not be of a sexual nature. In an unpublished monograph, in which an attempt is made to apply Adler's theory to motivation in general, I have endeavored to show that the perception of inferiority is the basic cause of all disquieting emotions such as anger, fear, pain, and other emotions. It is the exciting force that sets in action the reciprocal mechanism of the autonomic nervous system and the glands of internal secretion. This theory lends itself admirably to the explanation of the acquired gynecological neuroses. A pelvic

lesion, such for example as one due to the injuries of childbirth, constitutes a definite organ inferiority, and may in a short time produce in the most normal individual all the symptoms exhibited by the so-called constitutional neurotic.

It is of the utmost importance that the gynecologist be able to classify his nervous patients with reference to causation for only in this way can he avoid making mistakes in treatment especially in cases that involve the question of a surgical operation. One must distinguish the neuroses that have definitely been acquired as a result of pelvic changes from the constitutional fixations of childhood, or from those of a purely psychic character. One must recognize those cases in which there is a superactivity of the glands in contradistinction to those in which there is a glandular deficiency. And above all it is necessary to detect the cases wherein the nervous manifestations are due to the circulation of abnormal secretions like that in hyperthyroidism. The differential therapy to be employed in these various types of cases is of extreme importance, but does not come within the scope of this paper. The wise gynecologist will constantly seek the aid of the neurologist and medical internist, and in making the critical decisions as to treatment will require all his resources of education, in which psychology and philosophy are assets of unequivocal value.

In concluding this part of the paper it may be remarked that the more one studies the so-called nervousness of women, the more one is impressed with the possibility that the purely nervous mechanism of the body is of secondary importance. It is quite credible that the nerves are only the keys or instruments which are played upon by more dominant agents in the form of the endocrine glands. In comparison with men, women are said to be peculiarly nervous. Would it not be more accurate to say that on account of the undoubted instability of their internal glandular equipment women are peculiarly endocrinous? Whether this theory be true or not there is no doubt whatever that the gynecologist accomplishes more accurate results if he estimates his nervous patients from an endocrinological rather than from a purely neurological viewpoint.

THE OVARIES.

The second part of this paper deals primarily with the histogenesis of the secreting cells of the ovary and is presented with the hope of pointing out some practical lessons that may be gained thereby. It has been asserted and is more or less generally believed that the ovary is a compound secreting gland with at least two systems of secreting cells, analogous in that respect to the hypophysis and adrenals. Thus the hypophysis as a whole is composed of two very distinct parts which differ in their histogenesis, their effects on the body under the influence of disease and in the specific action of their respective internal secretions. The posterior lobe is nervous, or ectodermic in origin. Early disease of the lobe produces a dwarfish individual. Extract of the lobe, commonly called pituitrin, exerts an influence on the autonomic nervous system and is efficacious in the treatment

of atonic conditions of the smooth muscles of the bladder, intestines, and uterus. The anterior lobe on the other hand, is glandular, hence mesodermal in origin. Early disease produces gigantism, while extracts of the lobe affect chiefly the sexual system.

In like manner the adrenals are made up of two separate tissue structures, which are so distinct in their anatomical and physiological characteristics that they may properly be regarded as different organs, that happen to have developed in juxtaposition. The medulla has a common ectodermal origin with the sympathetic nervous system, from which it becomes separated during the process of embryonic evolution. The medullary cells are not only contained within the cortex of the adrenal body but are scattered along the sympathetic nerves or ganglia in isolated bodies. The intimate reciprocal association of the sympathetic and medullary systems we have already mentioned in our discussion of the influence on the emotions of adrenalin, the specific secretion of the medullary cells.

The cortical cells of the adrenals, on the other hand, are mesodermal in origin and are intimately related to the cells that compose the ovary. They spring from the same peritoneal layer from which the ovaries take their origin. The cortical cells resemble the cells of the corpus luteum so closely that attempts have been made to establish some sort of identity between them. As in the case with the adrenal medulla, the cortical cells are not confined to the adrenal body, but are found scattered along the track traveled by the ovary in its descent into the pelvis. Physiologically the internal secretory function is sexual, though comparatively little is known of its action.

Reasoning by analogy to the hypophysis and adrenals some have made the claim that the ovary is also a double functioning organ, the two sources of secretion being ascribed to the corpus luteum or follicle apparatus on the one hand and the ovarian stroma on the other. A study of the histogenesis and development of the cells that compose the ovarian tissue dispels the notion of a close analogy between the ovary and the other two glands mentioned, for it can be shown from an embryological viewpoint that the ovary is a single homogeneous organ and that the differences that exist between the various cell elements are due to a process of differentiation during the development of cells that have a common origin. A detailed description of the histological development of the ovary can only be referred to in briefest outline.

The ovaries are developed in the peritoneum and from the peritoneum. Their primary growth is characterized by a thickening in the peritoneal membrane due to a localized multiplication and change in form of the peritoneal cells. These cells constitute what is known as the germinal epithelium. The ovaries, at first simple thickened ridges in the peritoneum, attain their fusiform contour by a downgrowth of the germinal epithelium, into the subperitoneal connective tissue.

The germinal epithelium possesses a wonderful power of differentiation and growth. Owing to the researches of Allen, MacIlroy, Goodall, and others it is now known that all the inherent cell

structures of the ovaries with the exception of the connective tissue supporting framework are derived from the germinal epithelium. This includes the embryonic reté ovarii, and cords of Pflüger, the interstitial cells that crowd the stroma and surround the follicles, the granulosa cells that line the follicles, and finally the very ova themselves. The early investigators of the ovary as a gland of internal secretion believed that the source of the secretion resided solely in the corpus luteal cells, which in turn were thought to be exclusively modified granulosa cells. Further studies revealed that before the age of puberty the internal secretory function is performed by the interstitial cells, the existence of which had long been known. This idea then became prevalent that there are two secretions; one produced by the interstitial cells and one by the corpus luteum, and that these two secretions possess selective functional powers.

However, it has been shown that the main part of the corpus luteum cells, the theca lutein cells of follicle atresia and the cells of the interstitial gland found in animals, are all activating interstitial cells. Until comparatively recently it was generally supposed, as stated by Tandler and Gross, that the interstitial cells are derived from the connective tissue of the ovarian stroma, but this mystery has been solved by observations that the stroma of the ovary is actually composed chiefly of interstitial cells originally derived from the germinal epithelium and supported by a connective tissue which acts only as a supporting frame work. We must conclude, therefore, that all the cellular elements to which the source of an internal secretion may be ascribed are interstitial in character and origin.

This conclusion disposes of the theory that there exist in the ovary two separate and independently functioning endocrine organs. As a practical proof of the truth of these observations one would expect to find little or no qualitative difference in the clinical results from the administration of such extracts as those respectively from the corpus luteum, the whole ovary and from the stroma. And such in fact is the case. Early in our experience we gave up corpus luteum preparations in favor of those compounded from the whole ovary, not because there was any inherent qualitative difference in their action, but because we found that for the various gynecological purposes to which we applied them the products of the whole ovary were more reliable and more intensive than those from the corpus luteum alone. In order to test the actual value of the corpus luteum we excluded it altogether and treated a large number of patients with preparations from the rest of the ovary. It was not difficult to obtain the material, for up to this time it had been discarded, so far as medicinal purposes were concerned, during the manufacture of corpus luteum preparations, hence the name ovarian residue. It was no surprise to discover that the residue compared favorably with the whole ovary products, and that in some respects it appeared to be superior.

Though our observations and deductions lead us to deny the existence of two independent secretory organs in the ovary, we must admit the possibility

of a minor selective action on the part of different portions of the ovarian secreting substance but even here the variation is probably a quantitative one. Thus in our cases we have found the whole extract and the residue more efficacious than the corpus luteum in treating hot flushes, but the superiority is one of degree rather than one of kind. Other observers have found corpus luteum preparations of especial value in the nausea and vomiting of pregnancy. The finer distinctions drawn by some in the treatment of certain menstrual irregularities do not seem to us to have been unequivocally proved.

In the light of theoretical, experimental, and anatomical knowledge combined with long continued observations, our general estimate of the ovary as a gland of internal secretion may be briefly summarized as follows.

1. For complete somatic growth and sexual development the normal secretion of the ovary is essential. To what extent the action of the secretion is direct, and how far it serves as a balance to other more powerful secretory influences is a matter of speculation.

2. During menstrual life and especially during the years of adolescence, the proper functioning of the ovaries has a very important bearing on the physical and mental character of the individual.

3. Dysfunctions of the ovaries are usually attended with various neuroses. Some of these may be due to the direct disharmonious action of other endocrines, especially those that have an affinity for the autonomic nervous system. In evaluating these neuroses one must also take into account those neurotic habits which we have mentioned in the first part of this paper, as being the result of a sense of physical inferiority, and characterized as a continued endocrinous emotional state.

4. In the adult the ovarian secretion plays a somewhat minor rôle in the human economy, as is indicated by the comparatively slight physical changes that take place after ablation or the natural menopause. This has an important bearing on the question of removing the ovaries during hysterectomy.

5. During adult life the most definite evidence of the existence of a true internal secretion from the ovaries is the occurrence of hot flushes and genital atrophy after ablation. These symptoms point to a balancing rather than a direct action of the ovarian secretion.

6. From an organotherapeutic viewpoint, the ovary must be regarded as primarily a homogeneous gland, the essential secreting structure being the interstitial cells. Variations in secretions of different parts of the gland are probably differences of degree rather than of kind. A selective action of the secretion from different parts of the gland is not yet proved and if it exists is probably quantitative.

7. The therapeutic value of ovarian preparations in our experience, may be stated somewhat as follows: All the ovarian preparations exert a specific influence on hot flushes. In this respect the residue is the most intensive, but the difference in efficacy of the various preparations depends to some extent on the idiosyncrasy of the patient.

In the treatment of menstrual irregularities ovarian extracts exhibit an undoubted specific action but this action is inconstant. In temporary functional amenorrhea, delayed menses, dribbling before and after catamenia, and small clotting, ovarian therapy is fairly reliable, and is at least the best asset that the gynecologist at present possesses for these symptoms. Theoretically for these affections the ovarian action may be enhanced by the addition of thyroid and pituitary extracts, but of this our personal clinical experience has not been entirely convincing.

For the permanent amenorrheas, especially those associated with pluriglandular disturbances, ovarian therapy has little or no effect on restoring the menstrual function, but is of undoubted value in improving the patient's general health. It is best in these cases to administer the ovarian treatment in considerable doses, separately from the other gland extracts.

In certain types of dysmenorrhea ovarian feeding is efficacious, occasionally brilliantly so, but it is unreliable and often disappointing after giving early promise. In the severe types of dysmenorrhea it is of comparatively little help. For menorrhagia and metrorrhagia ovarian therapy is not indicated.

THE OBSTETRICAL DEPARTMENT OF A MODERN MEDICAL SCHOOL.*

The Equipment, Organization, and Scope of Teaching.

BY BARTON COOKE HIRST, M. D.,
Philadelphia.

It is a noteworthy fact that the revolutionary changes in the teaching and practice of obstetrics in the United States during the past twenty years has received little attention. In the forty-four volumes of the transactions of the American Gynecological Society, among the many papers presented at the annual meetings I remember but one that dealt with the improved training of young physicians who will be our successors. Has not the American Gynecological Society thus lost an opportunity for leadership which would have added to its prestige and influence? The trustees of medical schools, advisory committees, state legislatures and boards, naturally turning to the leading national society for advice and information, must have been astounded at its aridity in this field. My endeavor in this communication is to make a tardy amend for the neglect of a question which, it would seem, might have excited interest and received careful consideration long ago.

There are medical schools still undergoing reorganization under private control. Legislatures must give this matter thought in organizing the increasing number of schools supported by the State, the expense of technical education often making private management impracticable.

It is in the hope of furnishing information for the governing bodies of such institutions, and to give aid and support to the teachers who are ambitious

to have their departments as nearly as possible on an ideal basis, that the following propositions are advanced. In a medical school designed for about four hundred students in a four years' course, the equipment of an obstetrical department which entitles it to a respectable position must consist of:

1. A hospital of at least one hundred beds, with a clinical amphitheatre; a separate operating room for septic patients and an isolated space for infected women. The apportionment of beds should exceed that for surgery or medicine, for the average instructive capacity of each case in obstetrics is limited in the majority of instances to one or two students.

2. An ambulatory dispensary for the preliminary study of patients and for the followup observation and treatment of all patients after discharge from the hospital. Such a dispensary accumulates in time a large service illustrating all the pathological sequellæ of parturition, including practically all the diseases of women. It should be equipped with every appliance, including electrical, for treating women, and should have a social service department attached to it.

3. An outpatient department, with the necessary personnel of nurses, physicians and social service workers. This department should have a separate ambulatory dispensary. On a basis of about two thousand women cared for in their homes annually an enormous dispensary attendance can be secured of women awaiting delivery and, by a followup system, of women suffering from any of the complications or sequellæ of the process of generation at any stage. This service is a valuable feeder to the central hospital, to which all patients requiring operative or other hospital treatment are referred.

It is evident that such an organization gives the obstetrical department an amount of clinical material in all the conditions peculiar to women that no other department can rival or even approach. What is more important, every therapeutic measure required by women can be shown to the student; the preventive treatment of gynecological affections by the proper management of labor; the relationship of diseases of the pelvic organs to the reproductive function; the effect of operative measures on subsequent childbearing and vice versa. In short, to any intelligent student the necessity is made obvious, of a closely correlated study of all the pathological and physiological phenomena of the female generative organs; the effect of the former on fecundity and reproduction, and the causative relationship of parturition to the vast majority of women's diseases.

Such is the broad view of modern education, contrasting strikingly with the provincial American practice of the past; an obstetrical department concerned only with the delivery of women without regard to their future and a misnamed gynecological department dealing only with a moiety of the subject; busily engaged for the most part in patching up the results of other physicians' bad obstetrics. Such an arrangement was evidently doomed to extinction by modern progress and could no more be revived than we could recall to life the elder Mr. Weller.

The medical pedagogues of America must agree

*Read before the American Gynecological Society.

with their confrères in the rest of the world that the scope of obstetrical teaching embraces not only the physiology and pathology of reproduction but necessarily all the diseases of women. The chief of an obstetrical department must be a thoroughly trained abdominal and pelvic surgeon maintaining proficiency in his art by constant practice. Otherwise he is not fit for his position and would be incompetent to deal with the cases that may be admitted to his clinic at any moment; ruptured uterus with injury of intestines, requiring resection; diaphragmatic hernia in pregnancy; discovery of disease of the gallbladder in the course of an abdominal operation, and so on through a long list. In brief he must be prepared to deal surgically or otherwise with all the ills of women whether complicating pregnancy, labor and the puerperium or often their indirect consequence.

We have in the University of Pennsylvania a voluntary and a compulsory student's internship in the maternity hospital; the amount of material he sees, the notes he takes, and his conduct on the service are collated to establish his rating in the final examination. I find this record of a student's clinical opportunities during a voluntary internship of two weeks: Seven normal deliveries, an extraperitoneal Cæsarean section, transverse presentation with version, Cæsarean section for placenta prævia, compound presentation with two feet, hand, occiput and prolapsed cord, a Cæsarean section for a monster, dicephalus tetrabrachius, ten plastic operations, two ovarian cysts, a hydrosalpinx, a salpingitis, an exploratory laparotomy, a supravaginal hysterectomy, a large ovarian cyst, a cancer of the sigmoid: resection, six dilatations and curettage, three appendectomies, a gas anesthesia, a radium application, two intravenous injections of salt solution, a blood transfusion, two inevitable abortions, a uterine irrigation, and a ruptured ectopic gestation.

This same intern had another compulsory week's internship in the hospital; a two weeks' voluntary service in the outpatient department and another compulsory ten day period; a year of theoretical lectures; another year of clinics, conferences, section work and ward classes in which he saw, heard described, and personally assisted in the treatment of a large additional number of cases, such as have just been detailed. The following question naturally suggests itself: If the chief of an obstetrical department must be an accomplished pelvic and abdominal surgeon; if his department, properly organized and conducted, controls an amount of clinical material that no other can rival; if he alone in the medical faculty can teach all the conditions which the physician must treat in women, is it pedagogically or economically justifiable to maintain in a medical school a so-called gynecological department, which can only duplicate the teaching of the surgical and obstetrical departments and in a manner necessarily inferior to both? This question has already been answered in the only way it could be answered by the majority of our best medical schools; it is being answered as opportunity occurs by vacancies in existing chairs, and it will presently be answered conclusively and finally.

As an interested observer, an occasional participant in the transactions and an old member of the American Gynecological Society, it appears to me impolitic to allow a movement which vitally concerns us all to gain irresistible headway and to reach its ultimate goal, apparently ignored by the very organization that should have fostered and directed it.

The reason for our attitude is obvious: some of the members might fear an interference with their vested interests. Others, disinterested, might, in the spirit of a *laudator temporis acti*, be honestly convinced that the old order should not be disturbed. But the issue is too important to be influenced by selfinterest or unprogressive minds. This is the only country in the world now rich enough to adequately equip its medical schools; consequently the hegemony of the medical education of the world lies within our grasp if, having the money, we have the wit to seize it.

Apparently the world's centre of wealth, power and civilization, shifting with the ages from Mesopotamia, Egypt, Greece, Rome, and Northern Europe, is moving to this continent. It is an inspiring thought that each one of us puny mortals in his tiny sphere may play a part in such a stupendous cosmic drama. Let us teachers of one of the most important medical branches put our house in order, that we may merit a place among those who assist and do not hinder the passage to America of the world's leadership in medical education.

TREATMENT OF DISPLACEMENT OF THE UTERUS.

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PROGRESS IN GYNECOLOGY.

No division of medical science has made more rational and definite progress than that of gynecology. Nearly all the lesions affecting the pelvic organs of women have become so definitely classified that there is practically universal unanimity as to the methods to be instituted in treatment. Today indiscriminate sacrifice of reproductive structures has given place to judicious conservatism. Acute pelvic infection is no longer considered or treated as a surgical emergency with the accompanying high degree of mortality, morbidity and the useless sacrifice of the most vital organs of a woman's body. Postabortive and postpuerperal infections are now largely regarded as medical and not surgical conditions and, therefore, are treated along conservative medical lines. Premalignant conditions of the cervix are recognized and their serious significance is becoming more and more appreciated. These lesions, fortunately, are being treated less and less by expectant medical measures and prophylactic surgical procedures are being promptly applied. There is no longer discussion as to the proper course in ruptured extrauterine pregnancy, a topic that prominently held the stage until a few years ago. The introduction of radium,

however, has somewhat upset the established views concerning the treatment of uterine fibroids and carcinoma, but the majority of investigators are unanimous in believing that early surgical intervention is still the method of choice. This is as it should be, because no human mind can fully comprehend the true cellular nature of a neoplasm involving the organs concealed within the pelvic cavity.

GENERAL CONSIDERATION OF MALPOSITION.

However, in the treatment of malpositions of the uterus, there is still a divergence of opinion, but the majority of authors are advocating and employing surgical methods. This is due to the fact that no attempt has been made to draw a sharp dividing line between what constitutes on the one hand a medical, and on the other a true surgical displacement. Hence many men apply operative measures indiscriminately to all. Before instituting any plan, the indications for treatment should be most thoroughly considered and surgical methods only should be utilized in those cases associated with distinct concrete surgical complications, such as lesions involving the vaginal walls, the cervix, the uterine body or the structures in intimate pelvic relation with this organ. Medical and mechanical means are definitely indicated in the simple, uncomplicated malpositions. These methods should be utilized especially in virgin women, in young married women, in freely movable uteri and also in the prolapsus of elderly women of poor surgical resistance. Indeed, no simple, uncomplicated malposition of the uterus should be regarded as a surgical lesion and, therefore, displacements of this nature should not be corrected by surgical methods. A simple displacement is defined as one not associated with pathological change in the organ itself or in the surrounding structures. This definition seems entirely superfluous, but yet, as previously remarked, the distinction between this form and the so-called pathological type is not sharply drawn and surgical measures are applied to all.

Unquestionably, today, the uterus in simple malposition is more sinned against than sinning. This is especially true in this country, and have we not swung the surgical pendulum a little too far? Are not too many patients being operated upon? Are we not building up a major surgical condition from a minor, medical lesion? Certainly we have been more assiduously attentive in a surgical way to this condition than our confrères in Europe. Too frequently, indeed, we utilize surgical intervention without paying due regard to the causative factors, and I am persuaded that before deciding on any method we should weigh more carefully, investigate more thoroughly, not only the pelvic, but the systemic condition of our patients as well. Surely one cannot hope to afford relief by operating upon patients who are nervously and muscularly wracked. It is needless to state that a stem pessary cannot possibly accomplish good for a patient with a congenitally antiflexed, ill developed uterus, yet this so-called simple, but really dangerous and at times harmful, procedure is employed all too commonly. A uterus of this type is not the disease, but only a local pelvic manifestation of systemic trouble. A

rudimentary organ of this character usually occurs in large, obese women. This feature tells the tale of ductless glands or endocrine dysfunction and should be ample warning to any observer as to the futility of operation, such as curettage, the use of the metranoikter, stem pessary, or any of the other operative procedures commonly in vogue today. It is inconceivable that the Dudley or Pozzi operations should ever be performed for the condition described above and that these means should afford relief is likewise beyond comprehension. In these patients a general survey of the body should be a signal sufficient to tell us to leave the uterus alone. The multiplicity of surgical agencies recommended and employed in acute anteflexion should also be sufficient evidence to show that we are still distant from an infallible remedy and, moreover, that surgical treatment has failed to afford the results desired. Will any operation prove beneficent to poor nervously and muscularly incompetent women with the intraabdominal structures in a state of general dependency or ptosis? In these cases, should not the malposed uterus be regarded as a concomitant of the condition and not as a separate entity? The urologist and general surgeon have recognized the true status of the so-called floating kidney and the voluminous reports of operation for this condition which formerly appeared in our literature have practically disappeared. Will we, as gynecologists, study the physiognomy of the malposed uterus with the same degree of interest and intelligent interpretation?

LAW OF MALPOSITION.

It is absolutely incumbent upon the profession to keep in mind that no set rule applies to all cases. Every displacement is a distinct law unto itself, and will require, therefore, specific methods of treatment. Undoubtedly many patients will never get well unless operated upon, but it is not the function of this paper to discuss displacements of a surgical nature. It is my purpose to limit the consideration of the subject to medical and mechanical treatment and I shall consider the various malpositions separately. One of the most annoying, discouraging and distressing types of malposition is so-called acute anteflexion.

ACUTE ANTEFLEXION.

The condition described under this term rarely, if ever, occurs as a distinct concrete pathological lesion. Indeed, as a separate entity it is of doubtful existence. In the light of our present knowledge concerning the endocrine system, should it not be regarded as a physical phenomenon or sign of ductless gland disturbance and not a pathological condition of the uterus? Certainly the very unhappy and discouraging results obtained by local surgical treatment should be sufficient to force us to place acute anteflexion in the category of disease in which it rightfully belongs. While associated with local symptoms, such as scanty or absent menstrual flow, dysmenorrhea and sterility, these symptoms are seldom overcome by the local surgical agencies in common employment today. Rarely are these patients permanently benefited by curettage, the use of the metranoikter, the stem pessary, Dudley or

Pozzi operation, or any other surgical measure used at the present time. I have never seen the stem drain or pessary overcome sterility nor relieve dysmenorrhea for more than a period of three or four months, and most assuredly these implements cannot possibly have any influence in establishing a normal menstrual flow. I have personally seen serious damage result from the use of these instruments and the untold harm that results from their general employment is incalculable. Infection and permanent functional damage frequently result from the use of the curette. This is likewise true of the stem drain and the latter instrument cannot, indeed, be used without danger.

We have at the present time under our care two young women suffering from extensive pelvic peritonitis resulting from the use of the latter implement. Recently we operated upon a girl nineteen years of age for a vesicovaginal fistula. The opening in the bladder wall was three eighths of an inch in diameter and resulted from the bar or the arm of the pessary rubbing and perforating the bladder cavity. Therefore, should not the unhappy results obtained by the surgical methods as practised today be sufficient grounds to bar their continuance or at least modify their use? For some years I have entirely abandoned the use of curettage and the stem pessary in the treatment of acute ante flexion and I most emphatically disapprove of their use for this condition. A uterus in the majority of cases in acute ante flexion should be looked upon as a local evidence of systemic disease and any effort at treatment, therefore, must be directed along systemic medical lines. One should keep in mind that a certain proportion of these patients will not be benefited at all by any measure and in so far as the local uterine condition is concerned, it should be placed in the category of incurables. No known medical or operative agency will cause a uterus to grow. An infantile uterus in an adult woman will remain infantile forever, regardless of any plan of treatment, and the sterility associated with the condition will likewise persist indefinitely. The obesity, amenorrhea and dysmenorrhea, so frequently an accompaniment of the trouble, may be (to a certain degree) modified, but not cured. In a moderate degree of infantilism, however, function in a small proportion of cases occasionally is restored, but in pronounced cases never. Should we not, therefore, cease chasing the will o' the wisp and not only face the truth, but tell the truth as well? Too frequently these patients are persuaded to believe their symptoms will be overcome by surgery and all too soon is their dream of promised happiness shattered.

TREATMENT OF ACUTE ANTEFLEXION.

In the condition under discussion, four conditions are confronted, each demanding specific consideration and attention. First, obesity; second, sterility; third, partial or complete amenorrhea, and fourth, painful menstruation or dysmenorrhea. Perhaps the condition can well be described by outlining a typical case.

CASE.—At the present time, I have under my care a single woman, twenty-six years of age. She is five feet two inches in height, and weighs 236

pounds. Her menstruation was established at four-teen and always has been more or less irregular.

At present it recurs every three or four months and is manifested not by a flow, but simple spotting. The duration is less than a day and the discharge is accompanied by violent pelvic pain. Her uterus is typical of the infantile type. The cervix is long and its diameter does not exceed the tip of my little finger. The dimensions of the uterine body are all contracted and the organ is half the size of the normal virgin structure. Systemically she presents the train of nervous phenomena associated with endocrine dysfunction and rarely, as personally expressed, "do I enjoy a well day." This patient is responding well to treatment. During the first four weeks she lost twenty-six pounds in weight. Her nervous state is much improved. Her menstruation recurs regularly. The flow is moderate in amount, the duration is from two to three days, and the pain has been decidedly relieved. There is no palpable change in the uterine cervix or body, but the general improvement and the restoration of ovarian function have been remarkable indeed.

The marked obesity observed in these patients must be overcome by a strict dietary régime. It should be the custom to strike and strike hard at this phase of the trouble and endeavor to reduce the patient twenty or twenty-five pounds during the first four weeks of treatment. This can be readily accomplished by feeding the patient proteid broths, green vegetables, raw fruit and fruit juices. We generally instruct the patient to begin feeding at seven or eight a. m. and eat regularly every three hours for twelve hours or from seven or eight a. m. to seven or eight p. m., taking a cup of hot broth with a vegetable, a raw fruit or fruit juice. Tea or coffee without sugar or cream may also be taken. This régime is rarely a hardship and we have never experienced any difficulty in having the plan carried out. After the initial rapid loss, the diet is still restricted so that a progressive loss of from five to ten pounds a month is maintained until the patient returns to a relatively normal weight. We have succeeded by this plan in subtracting from fifty pounds, in mild cases, to seventy-five pounds or more in marked cases. In addition to a strict dietary régime, scrupulous attention should be given to the bowels. Two evacuations daily should be insisted upon and these should be accomplished, if necessary, by the use of a saline purge. The skin should be kept active by systematic exercise, obtained either in employment or by walking and also by a hot tub bath on retiring.

The obesity and other systemic phenomena are also favorably influenced by the administration of the organic extracts and furthermore these substances, in many instances, exert a happy effect on the menstrual disturbance. Frequently, these agents will increase, prolong, regulate, and occasionally reestablish the flow. Occasionally, also, the dysmenorrhea is relieved. While not wishing to go on record as asserting that these agents will cure sterility, yet I have seen apparently hopeless cases of the condition overcome and patients conceive. Even so I still ask myself: "Was the result

a coincidence or due to the drugs?" For several years we have used singly and in combination all of the organic preparations, but for the past three years we have settled down to a combination of three: Thyroid extract, pituitary extract, and ovarian extract. We begin with a small dose, starting with one grain of each in capsule three times daily and continue for three weeks. We then stop for a period of one week, at the end of which time we begin with two grains in capsule three times daily for three weeks, again discontinuing the preparation for a week. We then give three grains of each drug in a capsule three times daily for another three weeks, stopping a week and then continuing with the figure three, three grains, three capsules, three times daily, three weeks, for a period of six months or a year. By thus increasing the materials gradually and with a rest period no cumulative action, toxic or untoward effects have occurred. Despite the plan herewith outlined, dysmenorrhea frequently persists and we are not familiar with any agent that will afford complete or permanent relief. Benzyl benzoate, a substance on which we all based so much confidence and hope, has been generally disappointing. The coal tar preparations are not satisfying and opium or any of its derivatives we never recommend or use. Therapeutically, dysmenorrhea has no specific and is one condition, to use a homely yet descriptive phrase, in which we are truly "up against it."

UTEROVAGINAL PROLAPSE.

This, excepting inversion, is the most infrequent type of malposition and is more of an obstetrical than a gynecological problem. It constitutes about five per cent. of all displacements and usually follows a recent labor. The term is descriptive and implies that the displacement involves primarily the uterine body. It usually follows a long, hard, tedious labor in a patient unable to obtain the requisite rest of a normal lying-in period. It is seen in women who are unable or unwilling to take advantage of necessary care after labor. Therefore, the trouble can largely be prevented by proper prophylactic measures. Indeed, if all labor cases could be cared for properly, uterovaginal prolapse would exist only in name. On the part of the obstetrician, three conditions may be mentioned as causative factors: hastily forced delivery, neglect in failing to carry out primary repair of all lacerations, and failure to insist on requisite rest after delivery; on the part of the patient, too early resumption of the care of the baby and household duties, habitual overdistention of bladder, and violent straining in endeavoring to evacuate the bowels. The treatment then is summed up largely in the word prophylactic, on the part of both doctor and patient. If, however, one is confronted with an actual condition, the patient should be forced to secure absolute rest. The care of the baby so far as possible should be placed in hands other than those of the mother. The knee chest position should be assumed for fifteen minutes morning and evening, the bladder should be emptied every three or four hours and the bowels should be evacuated daily without straining, assisted, if necessary, with one of the heavy mineral oils or a low cleansing enema. If

the uterus is enlarged, subinvolved and heavy, depletion and reduction should be accomplished by glycerinized tampons and copious hot vaginal douches. The uterus should also be maintained in position by the introduction of a properly fitting pessary, preferably of the Thomas-Munde type. Finally the *sine qua non* is rest, and no treatment will avail unless this is placed first in importance.

VAGINOUTERINE PROLAPSE.

This is the most common type of surgical displacement and an advanced degree of this condition cannot possibly be corrected permanently and completely without surgical treatment. No medical or mechanical measure can overcome the second or third degree of the lesion, but the majority of cases of the first stage, as expressed in the term retroversion or retroflexion, if uncomplicated, can be treated successfully by medical and mechanical means. Included then under this heading are mild uncomplicated cases of prolapsus, retroversion and retroflexion. Before considering specifically the treatment of these conditions, I should like to refer to their symptomatology. Undoubtedly the accusations charged against these lesions have no foundation in fact. It is, indeed, questionable whether uncomplicated retrodisplacements ever cause any symptoms, although all varieties of disturbances are attributed to them. All forms of autonomic nerve phenomena are frequently assumed to originate in displacements of this character. Locally, backache, pelvic discomfort or pain, bladder irritation, rectal irritability and gastrointestinal disorders are described as symptoms resulting from malpositions of this nature. This description of the symptomatology is far from the truth, as abundantly proved by the small percentage of symptomatic recoveries occurring in patients operated upon. Rarely, indeed, does surgical procedure relieve either the local or general disturbance and the symptoms persist despite operative correction. Therefore, to attribute such a vast symptomatology to this condition is fallacious. Rather should the uterine condition be regarded as a result, not a cause of the autonomic relaxation. No normal movable appendage ever creaks or breaks the back of the parent tree and the same may be said of the uterus. It cannot possibly cause backache, nervous phenomena or any other of the great train of symptoms of which it is accused, regardless of position, so long as the organ remains natural in size and normal in mobility. Too many so-called backaches are attributed to the "uterus pressing against the spine," and the sooner we sever ourselves from this hereditary belief the sooner will we care for our patients more intelligently, the sooner escape the deserved opprobrium in failing to give our patients relief.

The first consideration in treatment of uncomplicated retrodisplacements should be directed along systemic lines. Every possible effort should be exerted to restore the patient to a normal physical and psychological status. The importance of muscular rehabilitation must also be kept constantly in mind. Nerve and muscle reconstruction are accomplished by freeing the patient from all nervous worry and fatigue, by obtaining for her an abundance of

physical and mental rest, by systematic forced feeding and by graduated exercise in wholesome fresh air. Proper and well fitting clothing should be worn. Overdistention of the bladder should be prohibited and a daily easy evacuation of the bowels should be insisted upon, for no other factors are so active in causation as these. Constipation must be absolutely overcome, for recovery cannot possibly occur with the patient violently increasing the intraabdominal pressure with every attempt at fecal evacuation. For this purpose drugs should not be employed, unless absolutely necessary. Mineral oil may be utilized, but a laxative diet with massage and exercise of the abdominal muscles are more desirable and more lastingly efficient. Locally, a copious hot vaginal douche of one or two gallons of plain hot water should be taken morning and evening. If the uterus is large and heavy, glycerinized tampons should be introduced twice weekly. The knee chest posture should be assumed for a period of fifteen minutes, morning and evening. Manual reposition of the uterine body should be performed and its position maintained by the introduction of a properly fitting hard rubber pessary.

PROLAPSUS IN ELDERLY WOMEN.

In marked prolapsus of elderly women of low surgical resistance, even in complete prolapsus, medical and mechanical methods, while not curative, will afford the patients untold relief. Again the importance of regular bladder and bowel action cannot be overemphasized. Overcome constipation and uterine displacements, a fertile field for the gynecologist, would largely disappear. Accomplish reduction or replacement manually and follow this by the introduction of a Menge pessary. The patient should be instructed to keep the parts scrupulously clean by using a plain hot water douche morning and evening. At the end of six or eight weeks the pessary should be removed, cleansed and reintroduced. If the parts have undergone involution or contraction, as frequently occurs, a smaller sized instrument should be used. If the pessary is worn for a considerable period of time involution of the vaginal walls always takes place and progressive reduction in the size of the implement, therefore, becomes absolutely imperative. After wearing the instrument for six months or a year, the patient may be allowed to discard it for a period of two or three months at a time; indeed, in some instances recovery is so marked that one could almost term it complete.

SUMMARY.

1. Therapeutically there is a distinct need for a specific line of division between medical and surgical malpositions.
2. The symptomatology of uterine displacements, in general, as taught today is erroneous. This is confirmed by the small percentage of so-called cures following operation.
3. Uncomplicated malpositions should be treated by medical and mechanical means. Operative measures should be applied to those associated with distinct surgical complications.
4. Operative intervention should not be utilized in the simple malpositions of virgins or young married women.

5. The infantile uterus never requires, nor is the condition benefited by surgery. Endocrine dysfunction as an etiological factor should be remembered. This condition should be treated and not the uterus.

6. Nerve and muscle relaxation (backache) should be regarded as a causative factor and not the result of uterine malposition.

7. Restoration of nerve and muscle power should be restored in all cases and is best accomplished by rest and generous feeding.

8. In no case of retroflexion or retroversion will the patient recover in the presence of obstinate constipation or bladder overdistention. Overcome constipation and malpositions will largely disappear.

9. The prolapsus of old women with low surgical resistance is best treated mechanically by the Menge pessary.

1621 SPRUCE STREET.

DISEASES OF THE CERVIX UTERI.*

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The ease with which the cervix may be amputated has, I am convinced, frequently led to its removal without due consideration of other possible means of restoring it to a healthy condition. A careful study of the aftereffects of amputation of the cervix, as ordinarily performed, must reveal that frequently the immediate result and at times the influence upon subsequent pregnancy leave much to be desired. In most instances the amputation is done to remove a cervix which has undergone hypertrophy and erosion. Such conditions result from laceration and eversion with exposure of the mucous lining of the cervical canal to infection, trauma and irritation of the acid vaginal secretion. To insure complete removal of the diseased cervical mucosa and eroded area, the internal incision in the formation of the flaps must be made so high across the mucous membrane of the cervical canal in most cases that the canal or internal os may be impaired. The latter may be left in a state of wide dilatation; the former may be tightly constricted by a ring of cicatrix perpendicular to the long axis of the cervix formed at the edges of the apposed flaps. A permanently dilated internal os favors infection of the uterine cavity, with the production of a leucorrhoeal discharge which is much more difficult to cure than that which resulted from the preexisting cervical disease. More important than the annoyance of the discharge is the influence of the infected uterine mucosa and widely patulous os upon subsequent pregnancy. Both produce unfavorable conditions for the retention of the impregnated ovum in the uterine cavity. Several cases of inevitable abortion have come under my observation in women who, before amputation of the cervix, had had no difficulty whatsoever in carrying a fetus to full term.

I recall especially one patient from whom I had to remove retained products of conception as a

*Read before the Northern Medical Association of Philadelphia, May 14, 1920.

result of spontaneous abortion in the twelfth week of gestation, two years after a high cervical amputation. She had undergone three normal pregnancies prior to the operation. About a year following the abortion I was asked to see her again

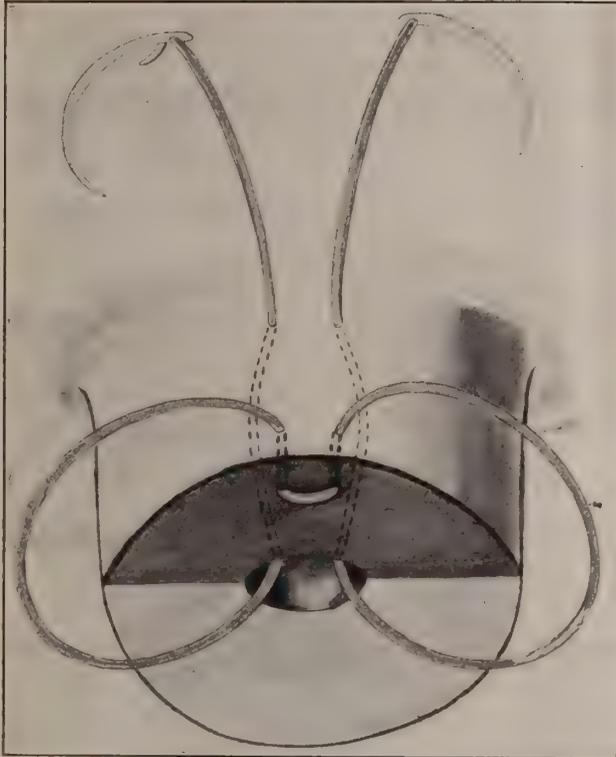


FIG. 1.—Introduction of sutures in the modified Bonney suture.

by her physician, and found her in the tenth week of gestation with evidences of another threatened abortion, and it was only by enforced rest in bed for a number of weeks that we were able to insure the continuation of the pregnancy.

Leonard (1) has reported abortion or premature labor in fifty-five per cent. of the pregnancies occurring in women whose records could be traced after amputation of the cervix in Johns Hopkins Hospital.

Stenosis of the cervical canal produced by a dense ring of scar tissue formed along the edges of the flaps may obstruct the flow of menstrual discharge and be the cause of dysmenorrhea. Such a cicatricial ring may produce a prolonged and exhausting labor and uterine dystocia because of the inability of the cervix to dilate properly. Indeed in some instances the cicatrix may refuse to dilate sufficiently to permit the passage of the fetus. Leonard found that in nearly seventy per cent. of the cases of amputation of the cervix the patients subsequently had difficult labor. In two patients I was forced to make bilateral incisions in such a cicatrix to insure complete dilatation of the cervix and permit the progress of the fetus through the birth canal. In addition to the unsatisfactory results thus far considered, failure to produce pleasing cosmetic effects by the usual method of suturing the flaps in the high Schroeder amputation of the cervix has induced me to seek and finally adopt measures which

have served to overcome the objectionable features of the older operations. These I shall describe later on.

No method of operation, however, will diminish the necessity for high amputation of the cervix in cases of extensive hypertrophy and erosion, because an operation which does not remove all of the pathological tissue, especially the eroded surface, is only partially successful. Any part of the erosion which is allowed to remain will continue to discharge and in time spread over the adjacent surface of the repaired cervix and thus lessen the benefit which the operation should have afforded. In so far then as amputation of the cervix is concerned, the following possibilities always may confront us: a, stenosis of the canal; b, permanent dilatation of the internal os, and, c, failure resulting from insufficient removal of diseased tissue.

Since the amount of cervical tissue to be removed must be controlled by the extent of the erosion, endocervicitis and hypertrophy, it would seem advisable to reduce these pathological changes, if possible, by other methods of treatment in order to limit the extent of the amputation or to abolish the necessity for its performance. Emmet and others of the older operators recognized the advisability of such procedure, but its practice has been neglected in recent years, much to the detriment of the patient. It has been my practice in the last three years to subject all patients suffering from a combination of erosion, endocervicitis, laceration and hypertrophy of the cervix to a method of treatment found to be uniformly successful in restoring the cervix to a healthy state before operation. In many instances operations have been avoided on cervixes which would formerly have been subjected to high amputation. It is the method employed in producing these results that I want particularly to describe.

The secret of success lies in the preparation of

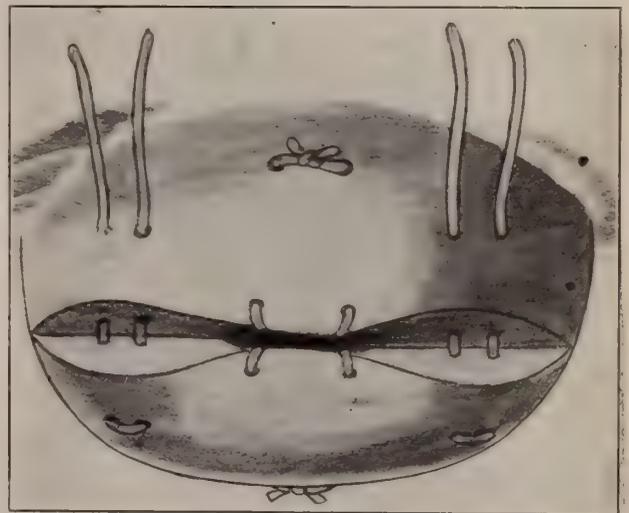


FIG. 2.—Sutures in the cervical wall at the edge of the internal flap.

the cervical mucous membrane for the reception of the active medicating agent. We know that the cervical canal in health contains a plug of clear, tenacious mucus. In pathological conditions the cervical secretion is increased in quantity and be-

comes thick, cloudy, mucopurulent, and still more tenacious. Most of the medicinal agents, such as silver nitrate, phenol, formalin or the organic silver compounds, which are useful in the treatment of diseased mucous membrane, coagulate mucus as soon as they come in contact with it. The resulting dense

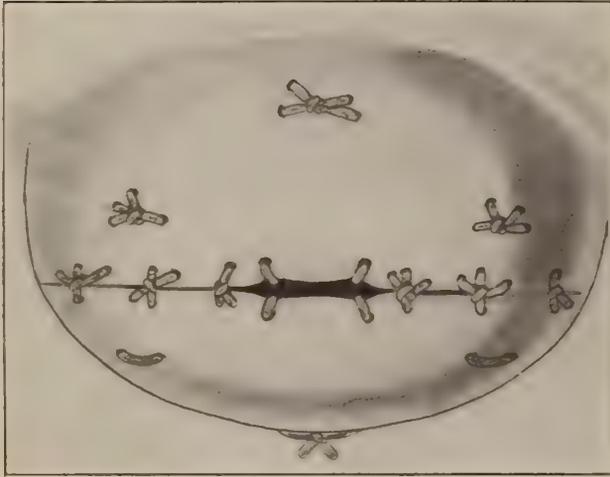


FIG. 3.—Sutures completed showing the tension distributed.

wall of coagulum acts as a barrier to the access of the medicinal agent to the mucous membrane and diminishes whatever effect it might have. Complete removal of the secretion cannot be effected by swabbing with gauze or cotton, or by the use of a suction apparatus, and these methods when persisted in frequently cause bleeding, which still further counteracts the action of the medicament.

After experimenting with different methods, I have found that the cervical discharge can be easily and thoroughly dissolved or dislodged by irrigation of the cervical canal with a weak alkaline solution of the following formula:

Sodii bicarb.,	} āā.....	gr. xl
Sodii chlorid,		
Sodii borat,		
Aqua, q. s.....		.01

I use for the purpose a large syringe, the tip of which is introduced well into the cervical canal and the fluid expelled under sufficient pressure to dislodge the mucus. Several injections may be necessary. There is not much likelihood of forcing the

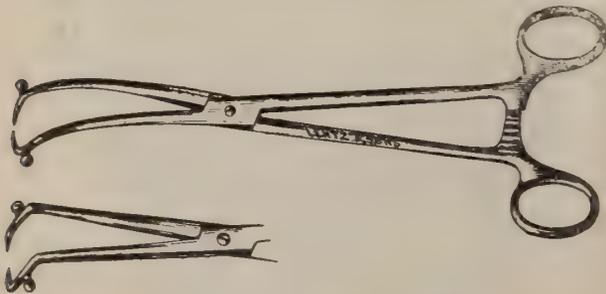


FIG. 4.—Angulated tenacula for hemostasis.

solution into the uterine cavity, unless the internal os is dilated or too much force is employed. Before beginning the treatment, the condition of the internal os should be determined with a thin sterile probe. If it is found too much dilated, as it rarely

is, the alkaline solution should be applied on cotton wrapped applicators instead of by irrigation. After the cervical mucous membrane is entirely clean it should be thoroughly dried with absorbent cotton, when it is ready for the application of the medicating agent. I find no drug so good as silver nitrate for the purpose of curing erosion and endocervicitis. In the aggravated cases of long standing, in which the mucosa is greatly thickened and the erosion extensive, I begin the treatment with a fifty per cent. solution, applied every three or four days. The first few applications are likely to cause bleeding from the eroded surface. As the discharge lessens in amount and becomes thinner and less purulent, the strength of the solution is gradually decreased to ten per cent.

If the cervix is large and boggy, the applications of the silver nitrate are supplemented with boroglycerin tampons until the cervix is reduced in size. The patient is given a prescription for the alkaline powder, with directions to use one tablespoonful in

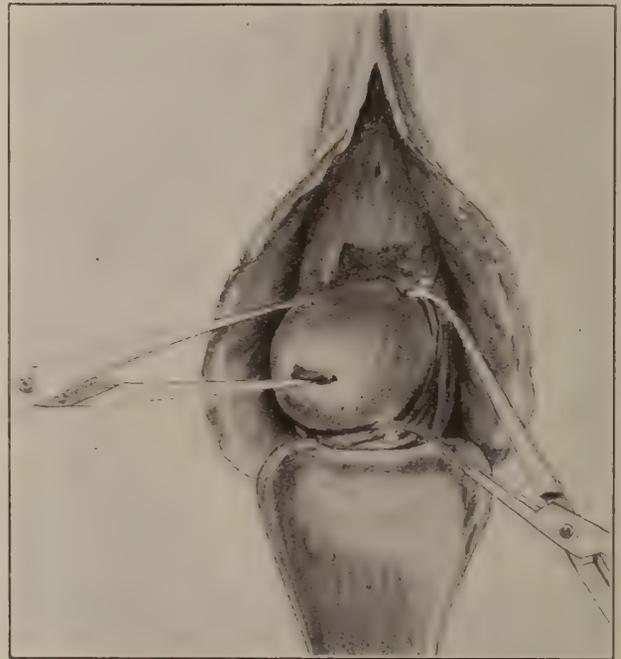


FIG. 5.—Angulated forceps applied to cervix above level of amputation.

two quarts of water as a vaginal douche once or twice a day, depending upon the amount of discharge. It is most gratifying to observe the changes which take place in the cervix under this treatment. The erosion gradually decreases in area through substitution of stratified squamous for the thin columnar epithelium. The change can be well seen at the edges where the ingrowth of squamous epithelium radiates toward the internal os. In addition, islands of squamous epithelium may be frequently observed in the centre of the erosion, looking very much like small skin grafts on a granulating surface.

By the time the erosion has disappeared, the cervical mucosa has returned to its normal state, the discharge has decreased in amount, and resumed its clear, mucoid character. Furthermore, the size of the cervix will have perceptibly diminished through the removal of the underlying cause of the

hypertrophy, except in those cases of a very tough, fibrous cervix. In many cases I have observed a shrinkage of fifty per cent. in the size of the cervix. The time required to produce the desired results by this treatment varies between three and six months. Its distinct advantage is that it lessens the

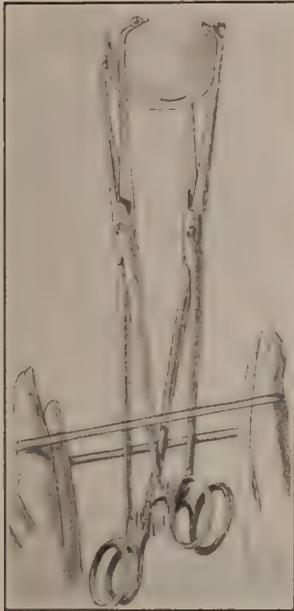


FIG. 6.—Seventh stage in technic of bloodless repair.

necessity for extensive amputation. The cases of bad erosion and ectropion which were formerly subjected to high amputation in order to get rid of the diseased tissue require after the treatment only trachelorrhaphy or a moderate amputation, if any at all.

In Leonard's most instructive and important essay, to which reference has been made, he has brought out the advantages of trachelorrhaphy over amputation. He showed that after trachelorrhaphy, as compared with amputation, there was an increase in fertility, a decrease in the frequency of

abortion and premature labor, and a more favorable influence upon the character of the first labor after the operation. He reports fertility in thirty-eight per cent. of the cases after trachelorrhaphy as against nineteen and four tenths per cent. after the amputation. Abortion and premature delivery occurred in twenty-eight per cent. of the trachelorrhaphy cases and in fifty-five per cent. of the amputation cases. The character of the first labor after each operation is interesting. "Following amputation of the cervix, the first labor was difficult in seven of the eleven cases. In striking contrast to this result is the fact that in eight of the ten cases of full term pregnancy following trachelorrhaphy labor had been easy." In addition to these figures of Leonard, other authors have shown that dystocia after amputation of the cervix (due to cicatricial stenosis) is not only of frequent occurrence but it may reach any extreme, even causing rupture of the uterus. "After trachelorrhaphy, dystocia has evidently seldom been met with, for references to its occurrence are very scarce."

If after the treatment of the cervix described herein an amputation of moderate extent is still required to reduce the hypertrophy and relieve the ectropion, it should be undertaken. In order to reduce the stenosis following the amputation and to eliminate the uneven surface produced by the older plan of tying the sutures over the edges of the flaps, I resorted to the Bonney suture to invert the long, external flap of the amputated cervix. Unfortunately, the traction of the suture not infrequently caused sloughing of the central area of the inverted flap, and left an ulceration which occasionally per-

sisted for a long time and in cicatrization caused a depression resembling a laceration, which detracted from an otherwise satisfactory result. This defect of the Bonney suture has been overcome in my later cases by introducing both ends of the suture about one quarter of an inch back of the edge of the external flap and then carrying them through the cervical wall at the edge of the internal flap before they are tied to each other. (Figs. 1, 2 and 3.) This modified method eliminates the pressure caused by tying the suture over the edge of the flap, distributes the tension over a wider area, prevents sloughing, and gives a better cosmetic result.

During the last two years I have further improved the cosmetic effect of amputation by exercising greater precision in fashioning the flaps and more exact coaptation of their edges. These results have been rendered easier by securing a bloodless field of operation.

The technic of bloodless repair which I have elsewhere described combines simplicity, ease of application, and efficiency. Hemostasis is secured through the use of two angulated tenaculum forceps (Fig. 4) and a rubber band about one quarter inch wide. The chief feature of the forceps, in addition to the angulation, is a pedunculated ball which is attached to the outer aspect of each blade

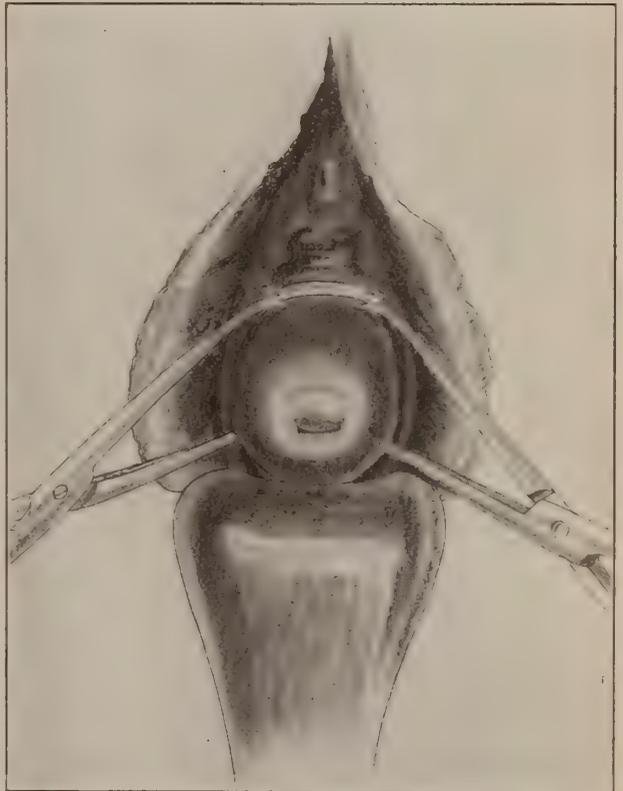


FIG. 7.—Handles of forceps separated to be held by the assistant.

above the angle. The balls serve the purpose of retaining the rubber band in a position to compress the cervix above the grasp of the forceps. The technic is as follows:

1. Introduce a selfretaining speculum into the vagina.

2. Grasp the anterior lip of the cervix in the median line with an ordinary double tenaculum.

3. Dilate the cervix moderately, chiefly to determine the precise location and direction of the canal.

4. Draw the cervix toward one side and apply the angulated forceps to the cervix, well above the level of the proposed amputation or denudation. (Fig. 5.)

5. Draw the cervix to the other side and apply the second angulated forceps opposite the first one.

6. Remove the ordinary tenaculum.

7. Place the handles of the forceps together, stretch the rubber ring over them and push the ring up on the cervix to a point above the retaining balls. (Fig. 6.)

8. Separate the handles of the forceps and hand them to an assistant. (Fig. 7.)

It will be observed that the forceps thus held act also as lateral retractors of the vagina. During the progress of the operation, the assistant should avoid undue tension on the forceps or unnecessary separation of the handles, in order to prevent making a ragged tear in the cervix with the points of the forceps. After the repair has been completed, cut the rubber ring and remove the forceps. The forceps and ring may be removed before the sutures are tied.

The application of these methods in over one hundred cases personally treated has shown that in more than half of them medical treatment alone was sufficient to cure the existing cervical disease. In most of the others, either trachelorrhaphy or moderate amputation restored the cervix to a practically normal state.

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SIXTEENTH AND SPRUCE STREETS.

AMPUTATION OF THE CERVIX UTERI.

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School and Hospital.

This operation I believe to be one of the most important that the surgeon is called upon to perform, on account of the frequency with which the necessity for it arises, and its effectiveness in accomplishing the objects desired. The fact that its performance is usually required upon women in the most active and responsible period of their lives, where the necessity for health and freedom from symptoms accompanying laceration of the cervix is most important to their well being and efficiency must also be considered. Perhaps its greatest and most important use is in prevention of cancer. The writer believes that he has demonstrated with many others, that the incidence of cancer of the lacerated cervix is about six times as frequent as in the unlacerated (1 to 9). If this is true, the surgeon has no better field of endeavor in cancer prevention than here, where, by restoring the cervix to a healthy condition, he could prevent five out of six

cases of cancer of this part of the body. For cancer of the cervix occurs about six times as frequently in lacerated cervixes as it does in the unlacerated. The writer does not believe in doing everything possible to increase the human population of the world, for he believes that many evils and infinite distress come from over population, but when a being has once arrived in the world, that he should be condemned to a death of a lingering, loathsome, painful character is one of the most distressing thoughts.

It seems that cancer is on the increase among civilized peoples, and its prevention by any possible means therefore assumes proportionately greater importance. In the writer's experience the most frequent indications for amputation of the cervix occur in the following order:

1. For extensive laceration and disease of the cervix due to childbirth.

2. Elongation and hypertrophied cervix occurring in prolapse of the uterus.

3. Dysmenorrhea and sterility due to acute ante-flexion of the uterus.

4. Removal of the cervix for chronic gonorrheal endocervicitis where the tubes have already been removed.

Amputation of the cervix for malignant disease is not included here because today if we find malignant disease of the cervix we do much more extensive operations, although two decades ago the operation done with a cautery was advocated by Byrnes of Brooklyn and had a considerable vogue for a time. But since this time the clinic of Wertheim in operative cases of cancer has centered the attention of the profession upon the most radical procedures.

The technic of the operation is practically the same in each of these conditions except the second where it is varied to meet other operative procedures which are resorted to for the cure of procidentia. The importance of a careful technic here cannot be exaggerated, as the chief use of amputation of the cervix is in relief of chronic irritation and the restoration of the vaginal vault to a healthy state. If the operation is done hurriedly and carelessly, leaving little points of tissue to granulate and areas to cicatrize, the object for which it is performed will not be accomplished. It must be borne in mind that it is a small organ, not much larger than the eye, and that therefore proper instruments, proper suture material, and a careful technic should be used.

As a preliminary step, there should be a gentle but careful curettage of the uterus, for in nearly all cases of laceration of the cervix there is endometrium hypertrophy as a result of the laceration. Following the curettage it is wise to make an application to the endometrium of equal parts of carbolic acid and iodine, wiping away the excess from the vaginal part of the cervix, but not from the body of the uterus. I advise the use of ten day chromicized catgut sutures as they have given satisfactory results. If plain catgut is used it is absorbed too soon and gaping of the wound may result. For some reason wounds of the cervix do not heal as quickly as those of other tissues of

the body. The suture material used should last at least ten days.

OPERATION.

A point is selected upon the left side of the cervix above the diseased part of the mucous membrane and the mucous membrane is cut through to the solid tissue of the cervix. The scissors are pushed along beneath the mucous membrane care-

fibres in the cervix which keep it closed having been cut away. As soon as its tissues become softened as a result of pregnancy and the fetus begins to attain weight, it sags down into the lower segment which starts dilatation with the invariable result of being expelled.

If the amputation is made to extend to a point within one third of an inch of the internal os, it will easily accomplish the purpose attempted and at the same time preserve for the patient the ability to carry a fetus to term.

A modification of this operation which has a distinct field of usefulness constitutes a combination amputation trachelorrhaphy. This is suitable for cases in which the laceration has extended to or almost to the internal os. The amputation if carried beyond the point of the laceration would remove so much of the cervix that childbearing would not be possible. By amputation of the anterior and posterior lips, and then by cutting out a wedge shaped piece from the site of the laceration on the sides, the operation may be completed, yet leaving a sufficient amount of the cervix to make childbearing possible. In labors following amputation of the cervix, it is not especially prone to tearing, but if this should occur it should be repaired again.

Since amputation of the cervix is frequently one of several operations done at the same time, the postoperative care is embraced in that which is observed for the sum total of the operations done. But where it is the primary and chief operation,

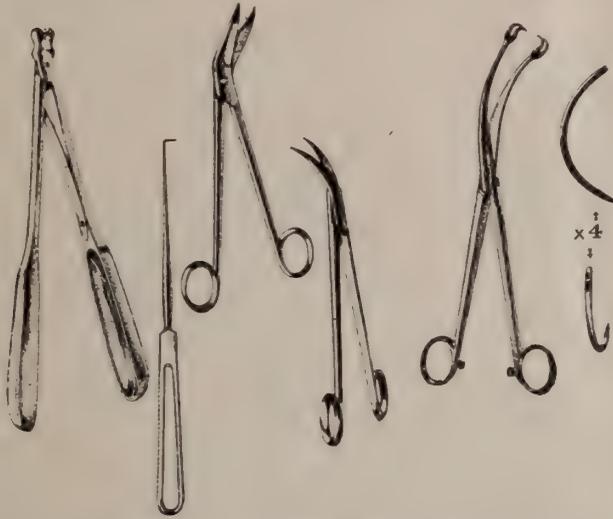


FIG. 1.—Cleveland's needle holder; Emmet's tenaculum; Tuttle's cervix scissors (right and left); double volsella forceps; Dudley's cervix needle.

fully preserving the proper distance from the os and surrounding the cervix with a circular incision, which usually corresponds to the line surrounding the cervix at its greatest periphery. The mucous membrane of the vagina is then wiped back with gauze to the desired height, that is, to a point above the diseased tissue. The cervix is then amputated with scissors by clean cuts at right angles to the long axis of the uterus. Two sutures are placed in the centre, in front, and two behind to bind the mucous membrane of the vagina to that of the cervix to insure a new canal which will not contract. These are passed first, then the sutures passing from before backward, picking up the mucous membrane of the vagina, then entering the solid tissue of the cervix beside the canal, emerging and picking up the vaginal mucous membrane of the posterior wall. From three to five sutures are used on either side at intervals of about one quarter of an inch, picking up the solid tissue of the cervix as well as the mucous membrane in front and behind. After all sutures have been passed, they are tied, beginning with the central ones, which pass into the cervical canal, then tying those on the side. For better understanding of the technic, see Figs. 1 and 2. The instruments used are also shown in Fig. 1.

HEIGHT OF AMPUTATION.

In cases of severe dysmenorrhea accompanying anteversion and where sterility also exists, care must be used not to amputate the cervix too high. If the amputation extends as far as the internal os, the patient will be unable to carry a fetus to term and abortion will occur almost invariably between the third and fourth month, the circular

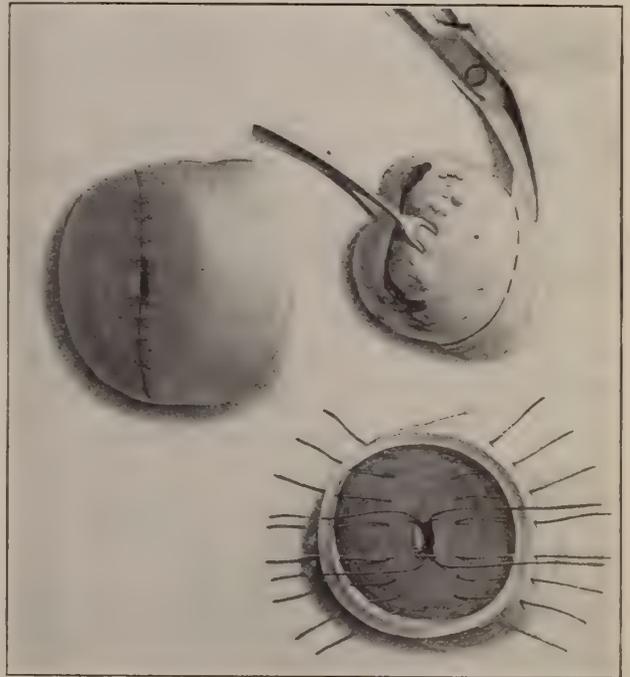


FIG. 2.—Amputation of the cervix (Emmet's method).

the care resolves itself to that of amputation of the cervix alone. A patient should remain in bed for at least ten days. Douches are unnecessary, except at about the tenth day, when a bichloride douche of one to six thousand may be given and repeated every other day for eight days. Other

aftertreatment consists in the usual attention to the bowels, the diet and the general comfort of the patient. It is unnecessary and bad technic to place gauze in or against the cervix after operation.

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- 71 WEST FORTY-NINTH STREET.

CERVICAL LACERATION, CYSTOCELE, PROLAPSUS UTERI, AND MULTIPLE FIBROMATA.

BY W. FRANK FOWLER, M. D.,
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Justification for making this report rests upon several remarkable features of the case under discussion and the information to be gained by a consideration of the various etiological, pathological, diagnostic and surgical problems incident to it.

CASE.—Mrs. S., a rather obese woman, aged forty-one, had always menstruated regularly every twenty-one days except during pregnancies. Her first pregnancy occurred in 1901 when a long and painful labor was terminated by instrumental delivery at her home in the city. Immediate repair of an extensive perineal laceration was made. On the day following delivery packing was inserted and left *in situ* for several days with the object, she surmised, of controlling hemorrhage. She remained in bed three weeks. Her strength returned rather promptly.

In 1903 she moved to a farm where a full term pregnancy was terminated spontaneously after a fairly easy labor lasting seven hours. Six months later she was annoyed by a bearing down feeling and pain in the back and sides and she noticed something protruding from the vulva.

In 1905 her third full term pregnancy ended in spontaneous delivery after an easy labor lasting four hours. The bulging later became more noticeable and she began wearing a cup pessary. Without this support she was greatly troubled with frequent urination if she was on her feet.

In 1907 she again became pregnant. She was miserable much of the time, the protrusion from the vulva became very marked and during early pregnancy there was profuse yellow leucorrhœa which became bloody occasionally. She flowed every day during the fifth, sixth and seventh months. This pregnancy ended at the eighth month in a

spontaneous delivery after a labor lasting six hours. The child lived only two hours. Again she experienced, as after the preceding pregnancy, an increased protrusion if the pessary was not worn. The three spontaneous deliveries were endured without anesthesia. During the past ten years she had had leucorrhœa. One year ago she began to gain in weight. Recently the pessary had failed to function and disability due to the cystocele had become extreme. Otherwise she felt perfectly well.

Examination under anesthesia revealed a very large cystocele and a second degree prolapsus uteri. The cervix, apparently, was the seat of an extensive bilateral laceration of the usual type with widely separated anterior and posterior lips. Further examination, however, disclosed a slit seemingly in the posterior lip and extending clear through it. Investigation of this opening showed that it was, in reality, the lower cervical canal terminating below in the external os. The relatively small posterior lip was behind it. The condition, then, proved to be a transverse tear slightly below the cervico-vaginal junction extending entirely through the anterior lip and across the midcervical canal. The bulky portion of the anterior lip below the tear had swung down and concealed the posterior lip behind it. The walls of the tear were amply protected by epithelial covering, but the floor consisted of eroded mucosa.

Operation March 11, 1920: The Mayo procedure for the relief of cystocele and uterine prolapse was done. The ovaries and fallopian tubes were not removed. The operation was unduly prolonged, first, because the general nodular irregularity of uterine outline due to unsuspected multiple fibromata contributed to the difficulties of hysterectomy, (one tumor, in particular, the size of a walnut, bulged into the septum between the uterus and the bladder), and second, because approximation and suture of the broad ligaments behind the clamps was difficult due to tension. It was decided, on account of the time consumed, to repair the perineum ten days later. Recovery from both operations was uncomplicated. The suggestion of Frank (1) that the administration of ether causes a constant lowering of the carbon dioxide capacity of the blood plasma in direct proportion to the duration of anesthesia merits serious consideration.

Pathological report: Multiple leiomyofibromata, subperitoneal, intramural and submucous; mild cystic glandular hyperplasia of cervix with active chronic cervicitis; greatly increased vascularity of cervix with hyperkeratosis.

Mayo (2) mentions, among the indications for his operation, the usual age limits of forty-five to sixty-five years and a particular applicability to the relief of uterine prolapse of the third and fourth degree. He also reminds us that when difficulty in approximation of the broad ligaments is anticipated uterine tissue may be retained on both sides. Although my patient was only forty-one years old, the prolapsus was merely of the second degree and uterine tissue could not be utilized to bridge the gap, nevertheless, the procedure seemed well adapted to relieve the pathological entity.

The indications for cervical repair or amputation,

Goldspohn (3) observes, are to be found in the pathological induration resulting from previous infection and inflammation following laceration rather than the laceration *per se*. Goldspohn believes that the pathological condition requiring operation is so generalized in the cervical tissues that amputation of the gland bearing lower half of the cervix is the operation of choice. Sturmdorf (4) also states that the occurrence of infection rather than the mere incidence or degree of laceration determines the morbidity of a cervical lesion. Sturmdorf notes, too, that the theory of reflex neuroses from alleged "pinching of the cervical nerves by scar tissue in the angles of laceration," is almost, but not quite, obsolete.

Regarding the occurrence of carcinoma following cervical lacerations, Ewing (5) writes, "Cervical carcinoma is strongly influenced by childbirths, which average over five in such patients. While carcinoma seldom develops in scars, yet repeated cervical lacerations disturb the normal structure and functions of this tissue, interfere with its nutrition and expose its weakened structure to chronic irritation and inflammation. A chronic endocervicitis precedes cancer in a majority of cases and the routine examination of this tissue reveals abnormalities in the morphology and position of the epithelium which constitute precancerous conditions. The most prominent of these conditions is the cervical erosion, many of which show suspicious hypertrophy and heterotopia of the lining epithelium."

In view of the fact that the patient in the case under discussion had three deliveries through a shortened cervical canal, a consideration of the effect of amputation of the cervix upon future pregnancies, from the viewpoint of tissue loss, at least, would not be amiss. Leonard (6) concludes, from a careful investigation of the literature, that "a pregnancy occurring after amputation of the cervix has not more than an even chance of progressing to term."

Pavlik (7) reports a personal case with the following history:

CASE.—Mrs. S., aged twenty-five, married six years, had a difficult forceps delivery eighteen months after marriage. She had a miscarriage a year later at three months. Shortly afterward an amputation of a badly lacerated cervix was done. Since the operation she has had three miscarriages at six and a half, four and three months respectively. I saw her in the third month of her sixth pregnancy. She complained of pain and bleeding. Two days later she miscarried. At present she is again about two months pregnant."

Pavlik emphasizes the importance of determining, if possible, the rôle played by the cervix during pregnancy and labor, and states his belief that at all events "the cervix acts as does a puckering string to a bag, or as a stopper to a bottle, so far as it relates to the gestating uterus, and its removal subjects the patient to the danger of uterine evacuation at all stages of pregnancy."

Holmes (8), on the other hand, admits the possibility of premature labor following amputation of the cervix but not so early that a living child might not be delivered, because it is very near ter-

mination of labor before the internal os gives way. Holmes concludes, therefore, that the cervix plays an unimportant part in gestation. Sturmdorf concurs with a statement that pregnancy and labor are intrinsically corporeal functions. Clinically, Holmes found, merely, that after amputation of the cervix the earmarks of labor were lost and the labor was exceedingly easy and uneventful. Heaney (9) also has observed easy labors following amputation of the cervix.

The question of the advisability of conserving normal ovaries in hysterectomy invites discussion. Culbertson (10) defines the menopause as a functional derangement on the part of various glands of the endocrine system subsequent to the cessation of the ovarian secretion. During the early years following puberty, for example, before glandular harmony has become established, castration is productive of but slight disturbance. Later, with some variations, the longer the gonad has been functionally associated with the endocrine group the greater disturbance there will be when that gonad is withdrawn, and further, the syndromes following the cessation of ovarian secretion present familiar pictures of underactivity or overactivity of the various ductless glands. This glandular interrelation has been discussed, also, by Frank (11), Goetsch (12), Graves (13), Loeb (14), Marine (15), Richardson (16), Vincent (17), and others. Culbertson believes that ovarian tissue should be retained whenever surgically possible.

Graves states that during maturity until the menopause the ovary plays a subordinate but not an insignificant rôle in the endocrine group. In the reproductive system, on the other hand, it is a predominant but not independent factor, since its proper function depends upon a normal relation with the uterus and its endometrium. The breaking of this relationship and the consequent upset of the physiological balance of the endocrine group, whether by removal of the ovaries or of the uterus, is of slight difference symptomatically. Retention of the ovaries after hysterectomy or of the uterus after oophorectomy are both potentially troublesome.

The investigation of Sampson (18) into the blood supply of the ovary convinces him that the actual supply is derived from the ovarian and uterine arteries. The potential supply is found in the communications between the arteries of the tube and of the broad ligament, branches of uterine and ovarian origin. The blood supply is considerably jeopardized by salpingectomy. The surgeon should therefore cut close to the tube and avoid mass ligatures of the broad ligament. Sampson has followed, with satisfaction, the safer plan suggested by Dickinson (19) of retaining the tubes in hysterectomy when the ovaries are conserved. Dickinson, in 1912, strongly advocated retention of normal ovaries.

Polak (20) believes that preservation of the menstrual function is the important consideration. To that end, when infected tubes require removal and one or both ovaries can be conserved, he protects the ovarian blood supply by a technic similar to that suggested by Dickinson with the addition

of removal of the fundus uteri. Polak (21) states, however, that in hysterectomy, with ligation of the uterine arteries, the ovarian blood supply is seriously reduced. The ovaries, too, when hysterectomy is indicated, are frequently abnormal. The life history of the retained ovary is only about two years. Polak has reoperated upon seventy-three women for painful and cystic ovaries within five years of the primary procedure.

Vineberg (22), in 1915, had reoperated upon two patients for cystic degeneration of the ovaries following hysterectomy for fibroma. Vineberg concludes that:

1. There is still uncertainty as to which tissue in the ovary produces the internal secretion.

2. Although the follicles continue to develop in the conserved ovary after hysterectomy, it is uncertain that the function of the internal secretion continues uninfluenced by the great changes in the blood supply and by the traumatism to the pelvic sympathetic nerves incident to the operation.

3. The relative influence upon the climacteric syndrome of oophorectomy and injury to the pelvic nerves during operation is undetermined.

4. Clinically, there is slight symptomatic differ-



FIG 1.—Posterolateral view showing the relatively small posterior lip, the long glass rod protruding from the external os and above, the enormous anterior lip with an angle of the laceration.

ence between hysterectomy with and hysterectomy without oophorectomy.

5. Logically, the ovaries should be retained at all ages and not limited to those under forty-five years, as is done by most of the advocates of conservation, since it has been shown that of the women who suffered most severely from the artificial menopause twenty-three per cent. were over forty-five years of age.

6. Subsequent disease of the conserved ovary occurs in some cases.

7. The clinical advantages accruing from retaining the ovaries in hysterectomy are doubtful and the likelihood of subsequent disease and adhesions of such ovaries is great. The ovaries should not be retained in hysterectomy unless enough of the lower uterine segment with its endometrium could be left to insure menstruation.

Vineberg cites a case in which supravaginal hysterectomy had been performed elsewhere. At reoperation sixteen months later Vineberg found the ovaries to be free from adhesions. One ovary was removed and proved to be normal microscopically. Vineberg notes that conditions were favorable for conservation of the ovaries since the uterus had been about normal in size and there was no dislo-

cation of the site of the ovaries as occurs frequently with fibroid growths of the uterus.

Richardson concludes, on the other hand, that our knowledge of the complex ovarian function is incomplete; that the uterus is not essential to a continuation of ovarian function except as regards menstruation and reproduction; that the disturbances of ovarian function attributed to hysterectomy are partly those associated with normal menstruation (the clinical syndromes of menstruation and of the physiological and artificial menopause differ chiefly in degree and rate of development), and partly those arising from damage to the ovary through unnecessary operative trauma or disease; that the weight of evidence furnished by anatomical, experimental and clinical investigations is overwhelmingly in favor of retention of sound ovaries both before and after the menopause age.

In response to a questionnaire the following replies were received:

Dr. J. Wesley Bovee (23): Normal ovaries should not be removed with the uterus in women under forty years of age. Since interference with the ovarian blood supply is so great in hysterectomy by the ordinary technic that rapid atrophy of the ovaries ensues we can only expect a slower and nearer normal type of menopause from thus leaving in the ovaries.

Dr. John G. Clark (24): I have always positively taken the ground that whenever it is possible to conserve the ovaries, particularly in young women, it is the wise plan to pursue. . . . I have worked on this basis for fifteen years and personally have seen no reason to deviate from that rule.

Dr. Edward P. Davis (25): Up to the age of thirty-five the ovaries, if healthy, should remain. The tubes should be removed in hysterectomy. In older women the ovaries should be removed with the body of the uterus, since, at this time, the ovary is most prone to degenerative changes. Ovaries retained after hysterectomy probably undergo rapid atrophy. It is practically impossible to remove the body of the uterus and the fallopian tubes without so interfering with the ovarian blood supply that atrophy or degeneration soon occur. This is the only reason why most operators invariably remove ovaries in hysterectomy. I have had several cases in which hysterectomy was done and the ovaries left, in which menstruation occurred from the uterine stump for an indefinite time. There seemed to be no inconvenience and the mental effect was good as the patient thought she was having no menopause.

Dr. E. C. Dudley (26): I have not removed ovaries in hysterectomy cases. They have not, in my observation, done any harm; on the contrary, there is apparently a more normal menopause and a more normal period of senility when the ovaries are left.

Dr. George Gellhorn (27): Cystic degeneration of the retained ovaries is usual. There have been adhesions around the ovary, or where the tunica albuginea shows thickening and smoothing out of the irregular folds of the surface, the saving of the ovary is a mistake. Without the uterus even a

normal ovary soon becomes atrophic. The symptoms of artificial menopause are greatly ameliorated by the administration of ovarian substance or corpus luteum extract. A radical rather than a sentimental attitude now influences me.

Dr. B. C. Hirst (28): If the woman is ap-



FIG. 2.—Anterolateral view showing the long glass rod protruding from the external os, traversing the laceration and entering the internal os, and the tear extending through the anterior lip and across the cervical canal, with margins widely separated by the short rod. (The specimen is somewhat distorted by the fixing solution.)

proaching the menopause I remove the ovaries. If she is younger I prefer leaving them on condition that I do not remove the tubes or interfere with the circulation of the broad ligament; otherwise I would prefer removing them as cystic degeneration would probably occur.

Dr. C. Jeff Miller (29): I retain normal ovaries in hysterectomy if the patient is under forty years of age. The ovarian circulation is carefully guarded because, if the ovarian vessels are tied cystic changes so commonly occur that it is best to remove the ovary. I am unable to determine, however, that the menopausal symptoms have been greatly reduced by retention of the ovaries.

Dr. Reuben Peterson (30): "I always retain one or both normal ovaries after a hysterectomy, whether it is supravaginal or panhysterectomy. I am firmly convinced that the patients suffer less from the effects of the menopause if this practice is followed."

Dr. G. W. Roberts (31): I have been removing troublesome tubes and ovaries from patients who had had the uterus removed at previous operations for the past twenty years. If I do anything which destroys the ability of the pelvic organs of a woman to function I make a clean sweep down to the internal os uteri, unless definitely commanded by the patient not to do so.

Dr. Arnold Sturmdorf (32): I always remove ovaries and tubes when performing a hysterectomy. Some of my reasons are that the ovaries and tubes present links in the reproductive chain of organs. Removal of the uterus breaks the chain by destroying an essential link. We find the surgical climacteric as pronounced in the cases in which the ovaries are preserved. Preservation of the ovaries after hysterectomy is a delusion, inasmuch as their arterial supply is cut off more or less completely. Ovaries left behind usually undergo various forms of degeneration, some of which are productive of symptoms that demand secondary removal. All arguments in favor of preserving the ovaries are

based upon a purely theoretical idealism and sentiment.

Dr. Howard C. Taylor (33): If the ovary is not removed and the tube is normal I retain the tube also as by doing so there is less chance of interfering with the blood supply of the ovary. Beyond the age of forty-five I make little or no effort to retain the ovary. Under the age of thirty-five I make every effort to do so. Between these ages, if the patient is inclined to be fat, it is an additional reason for saving the ovaries. In general I am sure that I make less effort to retain the ovaries than many men.

A comprehensive survey of the subject of ovarian conservation is beyond the scope of this paper. However, the wide divergence of opinion elicited by the queries of Vineberg in 1915 is equally apparent in the responses to my questionnaire. Dr. John G. Clark informs me that he has recently been making a careful study of the question with the hope that definite conclusions may be reached. The personal opinion of Dr. Clark is quoted elsewhere in this paper.

SUMMARY.

The subject of this report had a forceps delivery in 1901. At intervals of two years she had three subsequent pregnancies, all of which terminated spontaneously after short labors, two at full term, the third at the eighth month. After the second delivery she noticed a protrusion from the vulva, which increased after each of two later pregnancies. In 1920 she sought surgical relief for the disability resulting from the cystocele which a pessary would no longer support.

Examination prior to operation revealed an extensive laceration through the anterior lip and across the cervical canal, due presumably to instru-

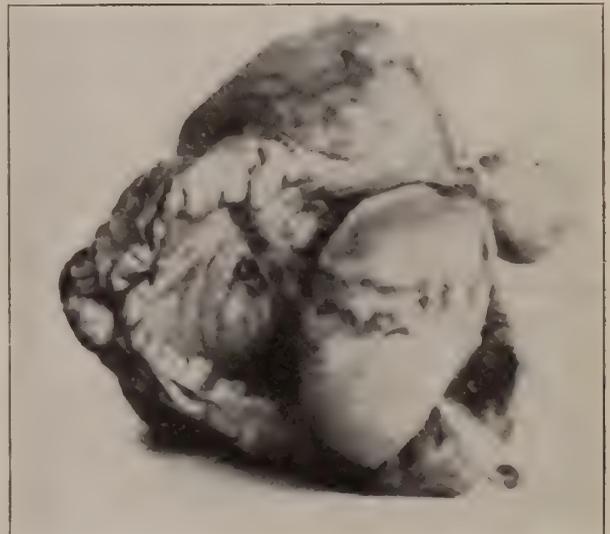


FIG. 3.—Showing, at the right, the long rod in the external os, in the centre the bulk of the anterior lip and to the left the gaping laceration and the remainder of the anterior lip. (Uterine fibromata are apparent in all three views.)

mental traumatism during the first delivery nineteen years ago. The tear had apparently remained undiagnosed, certainly untreated, during this long period. Examination of the uterus *in situ* and

after removal afforded convincing evidence that the three spontaneous deliveries had taken place through the rent in the anterior lip rather than through the external os. It is remarkable that this extensive laceration produced such a slight pathological change in the cervix; that three spontaneous deliveries occurred through it, and finally that surgical relief was sought after nineteen years solely for the disability due to the cystocele.

CONCLUSIONS.

1. A thorough gynecological examination three months after delivery should be routine practice.
2. The disability following cervical lacerations is dependent upon the degree of subsequent pathological condition rather than the tear, *per se*.
3. Premature or precipitate labors following amputations of the cervix are probably due to some other factor than the mere loss of tissue.
4. Operative morbidity and mortality will be decreased by multiple stage operations in lieu of one prolonged procedure.
5. The advisability of conserving normal ovaries in hysterectomy is still undetermined.

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The writer wishes to express his appreciation of the interest and coöperation shown by the personnel of the Department of Pathology of Hahnemann Hospital and particularly to thank Miss Evelyn Mead, of the Laboratory Staff, for the excellent photographs.

183 ALEXANDER STREET.

THE ROLE OF THE RECTAL EXAMINATION IN OBSTETRICS.*

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When I began the practice of obstetrics I felt that it was my duty to sit at the bedside of my patient with my examining finger tugging at the perineum from time to time to dilate the soft parts and stimulate pains. The women expected it and were encouraged, by the bystanders at least, to think that the doctor was helping them. Those of you who attended the lectures of the elder Penrose will remember his inimitable monologue and demonstration on the manikin, Mrs. O'Flaherty, of the conduct of labor. He taught that it was good for the young physician to familiarize himself with the process of parturition by keeping his hand in contact with the parts. This was modestly done under cover until the presenting part was about to be born; and this I think was typical of obstetrical practice at the end of the last century. Now the fashion has changed; the pendulum has swung to the other extreme and even vaginal examinations are anathema with some physicians.

Let us consider briefly—1. What can we learn from a rectal examination? 2. What advantage do we gain by this method? and 3. Is there any objection to a vaginal examination?

Considering the last question first, it cannot be denied that in a well conducted clinic or proper environment, vaginal examinations with the gloved hand or the carefully cleansed bare hand can be practised without detriment from the examiner's hand. And every one who has attended women even in very unsanitary surroundings, without clean towels or bedding, knows that they commonly succeed in avoiding infection. This fact, however,

*Read before the Philadelphia Clinical Association, October 4, 1920.

does not warrant one in disregarding the ordinary rules of sterility. As to the patients themselves they are the hosts of a variety of organisms which increase in virulence from the cervix to the vulva. The folds about the clitoris and the glandular discharges about the posterior commissure of the vulva are especially likely to harbor infective germs. The Döderlein bacillus is credited with immunizing the upper part of the vaginal tract against infection. Now it is impossible to make a vaginal examination without carrying germs from the lower to the upper part of the vaginal canal; and if these are of a virulent type the risk to the patient is not avoided by any preparation of the doctor's hands, no matter how careful he is. Routh, of London, has shown, with respect to Cæsarean section, that where repeated vaginal examinations have been made and where attempts at forceps delivery have been undertaken the mortality following the operation was vastly greater than where the same operation was done on patients in labor with unruptured membranes and few examinations. Dr. Beck in reporting a series of Cæsarean sections done at the Long Island College Hospital observed that the morbidity following the operations was thirty per cent. in cases where vaginal examinations had been made, whereas it was only twelve per cent. in cases where no vaginal examinations had been made. DeLee (1) records the occurrence of two deaths from infection in the service of the Chicago Lying-in-Hospital due to coitus shortly before parturition. These citations—and many more could be adduced—show the harmful effect of invading the birth canal shortly before labor.

Let us consider, for example, the patient to whom we wish to give the test of labor. Such a one is a potential case for operation and examination from time to time over a period of twenty-four hours or more would be the usual practice. If in the end section is resorted to, the patient's well-being both as to morbidity and mortality will be enhanced if no vaginal examinations have been made, or what is only a little less satisfactory if only one vaginal examination is made immediately prior to delivery; for it is the repeated examinations over a long period that are most likely to give rise to infection.

In the normal course of delivery Nature provides a flushing of the birth canal when the bag of waters ruptures, when the fetal ellipse advances, and again when the afterbirth and membranes are discharged—the current being always from above downward. Such patients quite uniformly do well, if the doctor fails to arrive on time, thus emphasizing the implied suggestion not to meddle with Nature's plan by introducing something from below to the upper part of the canal.

What can we learn from a rectal examination? The tyro learns nothing, and it is difficult to convince the beginner that it is worth while to practise the method often enough to acquire confidence in his findings, for a large experience is required to learn the finer points. The reason for making any examination is, of course, to learn whether the patient is in labor; how far advanced the labor is;

and whether there is any malposition or disproportion.

It is not difficult to determine whether the head is high up or low down. Anyone can do this. If the cervix is not effaced it is readily felt through the bowel. However, if it is partially dilated and thinned out to the thickness of a knife blade it becomes a difficult matter to recognize it; but patience and perseverance even in these circumstances will often reveal the exact amount of dilatation. One first endeavors to recognize the thinnest area over the presenting part and then by gently thrusting the finger tip around in different directions one will be able to insinuate it beneath the rim of the cervix at some point in its circumference, and having done so to follow around its whole circumference. When the head is well in the pelvis it is not difficult to recognize the direction in which the sagittal suture lies. This information supplemented by the external findings, namely, the location of the small parts, the back and the fetal heart sounds will very definitely point to the position of the occiput. Thus in ninety per cent. or more of the cases one can get all the information that is needed in the conduct of a labor. By careful examination, when the head is low down, one should recognize the cranium, and in the event of another part of the fetus presenting, recognize that it is not the cranium. Thus a foot or hand is easy to recognize. It is more difficult to recognize a breech. The latter has been mistaken for a head both by vaginal and rectal examination. A face presentation by its irregularity and lack of rotundity should excite the suspicion of the examiner, so that if need be a vaginal examination can be resorted to. And in all cases, for whatever reason, when aid is to be invoked a thorough vaginal examination should be made. When the presenting part is high in the birth canal or movable above the brim, this fact is recognizable by rectal and external examination, although one would scarcely rely on such an examination for making a prognosis. When no advance is made, after a prolonged period of severe pain, sufficient to make an impress on the mother's or baby's pulse, then of course a vaginal examination would be in order before deciding on the plan of giving aid.

What advantage do we gain from this method? From the point of view of the patient, we avoid pushing any germs from the lower zone of the birth canal to the upper. An examination shortly before the completion of the second stage is less deleterious than repeated examinations over a period of twenty-four hours or more. From the doctor's viewpoint there is this to be said: There is no diversity of opinion as to the propriety of using sterile gloves, or in lieu of that, preparing the hands as if for an operation, or indeed of doing both when making vaginal examinations. This takes time and, in winter especially, is hard on the hands, and soon causes chafing or worse. Now if one adopts the rectal method of examination it is necessary only to put on a clean rubber glove—it need not be sterile—apply a lubricant and insert the finger into the rectum and thus acquire all needed information without loss of time, or skin

in scrubbing. By all needed information I mean that we learn that the labor is progressing normally or, on the other hand, that it is not progressing normally and some aid will have to be given. In the latter event, of course, we make a vaginal examination since we are going to work through the vagina.

CONCLUSIONS.

There is a distinct risk, in making vaginal examinations, of carrying up into the birth canal organisms which under favorable conditions may prove deleterious.

One can learn from a rectal examination all that is necessary to know in order properly to conduct a delivery in ninety per cent. of the cases.

From the patient's viewpoint this method does not go contrary to Nature's method of protecting the puerperal woman.

From the doctor's viewpoint it is attended with much less waste of time and trouble, and is therefore a procedure well worth the effort spent in acquiring confidence in it.

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CÆSAREAN SECTION FOR ECLAMPSIA.*

By EDWIN G. LANGROCK, M. D.,
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CASE.—The patient was admitted to the obstetrical service of Dr. Brodhead at the Harlem Hospital on November 23, 1919 at six p. m. Her age was twenty-one, and she was pregnant for the first time. She was in a state of coma and had had three general convulsions before admission, one convulsion while being admitted, and one twenty minutes later. From then until she was operated upon at 7:30 p. m., she had three more severe generalized convulsions, making eight in all. Her urine showed about two per cent. albumin and all varieties of casts and blood. Her blood pressure was 158 systolic. She was eight and one half months along in her first pregnancy. The baby was of moderate size and presenting with the vertex in the right occipitoanterior position. Her pelvis was ample in size. The patient was not in labor and her cervix was long, conical and closed.

Since the prognosis in eclampsia depends upon the earliest possible delivery of the baby, after the first convulsion a Cæsarean section was decided upon. At 7:30 p. m. the classical operation was performed. An incision six inches long was made in the midline one third above and two thirds below the navel. In making the incision it was noted that the abdominal wall was markedly edematous, the tissues being water logged. The remainder of the operation was easily performed and a living baby, weighing seven pounds, was extracted. In placing the sutures, twice the usual number of silk-worm gut retention stitches were taken on account of the condition of the abdominal wall.

*Case reported at a meeting of the Harlem Medical Society, February, 1920.

The patient was given the usual eclamptic treatment of hot packs, colon irrigations, etc. She had no convulsions after her operation and in forty-eight hours was conscious and rational. Her condition was excellent until the third day when examining the dressing it was found to be saturated with a brownish fluid, her temperature being normal, and pulse 106 the same as it had been since the operation.

On removing the dressing a mass of intestine was found on the abdominal wall. The patient was immediately taken to the operating room and anesthetized and the wound resutured. About two feet of small intestine had been extruded through the abdominal incision, six inches of which was adherent to adhesive plaster, with which the gauze dressing had been fastened to the abdominal wall. This was gently separated from the intestine by pouring ether over it. The intestinal mass everywhere covered by plastic exudate was replaced in the abdominal cavity and the wound resutured.

The patient left the hospital three weeks later with complete union of the abdominal wound, there having been no further difficulty except a small stitch abscess.

The patient's temperature was over 100° F. only once, and that was on the fifteenth day from some extraneous cause.

INTERESTING FEATURES OF THE CASE.

1. The treatment of the eclampsia by Cæsarean section, the patient having no convulsions after the delivery.
2. The edematous condition of the tissues in eclampsia which must be taken into consideration in placing the sutures.
3. The fortunate outcome of the case in spite of the possibility of peritonitis.

REPAIR OF INJURIES TO THE PELVIC FLOOR.

By W. CLOVIS CUMMINGS, M. D.,
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It is only within a comparatively recent period that the female perineum, its nature and functions, have been properly understood. In the study of human anatomy the female perineum has not received the attention that its surgical importance warrants. Most textbooks make its description secondary to that of the male perineum, emphasizing only the important structural differences. Probably this custom originated at a time when gynecology was little studied and operations were relatively much more frequently performed on the male perineum than on the female.

The pelvic floor is made up of skin, superficial and deep fasciæ, and muscles. The muscles are eight in number—two ischiocavernosi, two bulbocavernosi, two transverse perineal, the levator ani and the sphincter ani. These muscles blend with each other and form a complete muscular diaphragm, which fills the bony outlet of the pelvis. These muscles are still further strengthened by lay-

ers of strong pelvic fascia which bind them together and increase their power. The muscular elements which enter into the construction of the floor are its chief source of strength, and the levator ani is the most important of all muscles, as the support which is afforded to the pelvic viscera depends entirely upon its integrity.

If we compare the perineal region of a woman who has not borne children with that of one who has, a difference is at once noticed. A difference exists even though there has been no visible tear in the second woman or only a tear which has been treated by the usual primary operation. If the nullipara is young and a virgin it will be seen that the anus is well forward and that the perineal body is short in its ventrodorsal diameter. In a woman who has given birth to a child the anus is always displaced dorsally. If the perineal body is superficially intact the ventrodorsal diameter will be greatly lengthened; if torn, the perineal body will be shortened, the mucous membrane everted, and the vulva will gape. If torn and repaired primarily, the perineal body will be lengthened ventrodorsally and, therefore, shortened vertically. The dorsal displacement of the anus is a constant deformity. There are three types of injury of the pelvic floor: superficial median tears, median tears involving the sphincter ani, and lateral tears involving the vaginal sulci.

SUPERFICIAL MEDIAN TEARS

A superficial median tear extends in the median line from the fourchette either backward toward the anus or upward into the vagina or both. It splits the tissues between the posterior border of the vulvovaginal orifice and the anus, and occasionally extends internally an inch or more up the posterior wall of the vagina. These tears are of no practical importance as the integrity of the levator ani muscle is not damaged nor destroyed. Occasionally, however, the cicatrix which is formed may become irritable and cause local tenderness and reflex disturbances.

MEDIAN TEARS

Median tears involving the sphincter ani extend backward in the median line from the fourchette through the sphincter ani muscle, and in some cases may continue up the rectovaginal septum for a distance of an inch or more. Sometimes all the fibres of the sphincter are not completely divided and the appearance of the tear may be deceptive. These tears permanently destroy the function of the sphincter muscle. The levator ani muscle is not torn and consequently the supporting power of the pelvic floor remains unimpaired.

LATERAL TEARS

Lateral tears involving the vaginal sulci extend from the fourchette up into one or both of the vaginal sulci and are usually accompanied by a superficial median tear toward the anus. This laceration is, as a rule, bilateral, though in rare cases the injury may occur on only one side of the vagina. In this type of laceration the function of the levator ani muscle is destroyed and the pelvic organs, as well as the terminal ends of the urethra, vagina and rectum, are no longer supported or maintained by the pelvic floor. As a rule involution of the uterus and vagina

is arrested and in time the uterine ligaments as well as the pelvic connective tissue become elongated and stretched, resulting in prolapse of all the pelvic organs.

The treatment of lacerated perineum and of injuries to the pelvic floor is exclusively surgical. Unless the condition of the patient is a contraindication, immediate repair of all lacerations should be made within twenty-four hours of delivery. A physician who attends a case of labor is grossly negligent if he fails to make a careful inspection of the pelvic floor as soon after delivery of the child as is consistent with the safety of the mother.

It is with unrepaired tears of the third variety that this paper is concerned. An operation which has proved satisfactory is performed as follows:

A U or V shaped or transverse incision is made along the mucocutaneous line. The scar tissue is removed by denudation with the scissors to allow access to the deeper and more important structures. In inserting the scissors care must be exercised to keep the points pressed against the vaginal wall. By delicate manipulation with the scissors, or perhaps better with the gauze covered finger, the plane of fascia separating the vaginal and rectal walls is found and the underlying tissues are quickly rolled off the vaginal wall so as to expose the two walls. The tissues are easily and safely separated as far as desired without producing any bleeding. The flap should now be elevated and care should be used to see that the dissection extends sufficiently high on either side to expose the upper border of the levator ani muscle. The layer of veins is the guide to safety and one should keep within the line of cleavage so as to avoid injuring the rectum.

The method of introducing the sutures is no less important than that of denudation. The wound is preferably closed in two layers. The first row of sutures approximates the levator ani muscle and fascia in the median line. Each suture should include deep bites of the muscle and fascia on either side. This puts the muscle and fascia on either side on tension and brings them into view, thus giving a broad surface for approximation by figure of eight sutures. The second row of sutures unites the mucous membrane and skin down into the muscle and fascia. The wound is closed by running sutures, locked at intervals. Twenty-day chromicized catgut should be used for approximation. Where this is not available, tension sutures of silk-worm gut should be employed. Care should be taken to keep sutures and scar tissue from the immediate vicinity of the vulvovaginal glands. Otherwise a hypersensitive and troublesome scar or cyst formation may result.

235 AMERICAN NATIONAL BANK BUILDING.

Rôle of the Ovary in the Female Organism.—Alfred Labhardt (*Schweizerische medizinische Wochenschrift*, May 6, 1920) uses much space to say that the influence of the ovary on the general condition of the body is much less than that of the other endocrine glands, yet this influence is great, not only on the genital system, but also on the entire organism.

THE FEMALE PELVIC URETERS.*

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Palpation of the pelvic ureters should be a part of every vaginal examination. During examination there is nothing between the fingers and the ureter but the vaginal wall. The ureters can be felt from the bladder to the pelvic brim. At the New York Polyclinic Hospital it was easy to teach students to palpate the ureters, after they had learned their position, by inserting ureteral catheters into them.

The ureters are an inch apart in the trigone, about an inch behind the internal urethral opening, and two inches behind the external meatus. They are about two inches apart at their entrance into the bladder, where they run through the bladder wall for three quarters of an inch. These points are about half an inch in front of the cervix on the anterior vaginal wall, and about an inch from the crossing of the ureter by the uterine artery. After leaving the bladder the ureters curve over the anterior vaginal wall and lateral fornix, to a point half way between the lateral border of the cervix and the pelvic wall, where they are crossed by the uterine artery on a level with the internal os, about an inch from the lateral border of the cervix, two inches from the ureteral openings. From the point of crossing, the uterine artery accompanies the ureter for one or two inches through the base of the broad ligament, to a point on the pelvic wall just above the spine of the ischium, where they turn upward on the pelvic wall covered by peritoneum, sometimes in front and sometimes behind the internal iliac to the pelvic brim, where they leave the pelvis through the infundibular pelvic ligament behind the ovarian artery. The right ureter is more often in front of the division of the common iliac, the left one behind it. The ureters are often outlined on the anterior wall by the ureteral ridges. In 1880 Pawlick catheterized the ureters using the ridges as landmarks.

TECHNIC OF PALPATION

To palpate the ureter from the bladder to the base of the broad ligament to orient the position imagine a line from a point, about half an inch in front of the cervix, to a point half way between the lateral border of the cervix and the lateral pelvic wall. The point half an inch in front of the cervix where the ureter enters the bladder, varies with the position of the cervix. The point half way between the lateral border of the cervix and the lateral pelvic wall, is where the uterine artery crosses the cervix and is fixed.

The vaginal fingers are introduced into the anterior lateral vault of the vagina. Counterpressure is made downward through the abdominal wall. The fingers are drawn forward. As the tissues slip through the fingers, the ureter is palpated as a flattened cordlike body, smaller than a goose quill, displaced in its bed of loose cellular tissue, as it slips through the fingers. It can be rolled from side to side under the palpating fingers by moving

the fingers toward the bladder, or toward the broad ligament. The ureter is felt from the bladder to the base of the broad ligament. Posterior to the broad ligament it is felt just above the spine of the ischium, covered by the peritoneum, to the pelvic brim, by palpating it against the pelvic wall. It may run as high as an inch above the ischial spine. Judd (1) advises sweeping the fingers above its location, bending the fingers as in picking a guitar. In the latter part of pregnancy the ureters do not follow the pelvic wall to the spines of the ischium, but after accompanying the internal iliac artery they pass beneath the broad ligament just below the pelvic brim.

EXAMINATION OF THE URETER BY RECTUM

The finger is inserted to the bifurcation of the iliac artery, which is located and traced downward with the tip of the finger. The palpation is done behind, at the side, and in front of the artery. The ureter can be followed in its course until it passes under the broad ligament. The normal ureters never cause pain. If diseased, they are enlarged from the size of a goose quill to that of a lead pencil, or larger; if tender, pressure brings an intense desire to urinate. The tuberculous ureter feels like a string of beads. Calculus, pyelitis, tuberculous kidney, gonorrhoea, cervicitis, lacerations, and infections from the cervix cause urethritis, periureteritis and stricture, and because of the nerve plexus of the abdominal sympathetic, pain is diffuse and causes symptoms in adjacent abdominal viscera, bladder, uterus, ovary, appendix, stomach, gallbladder and other organs. If irritation passes over the intercostal nerves, pain in the abdominal wall results; if over the lumbar plexus, pain in the inguinal hypogastric and external genital regions; over the sacral plexus, pain in external genitals, rectum, thigh, legs; the uterine plexus where artery crosses ureter, pain in uterus; ovarian plexus to ovaries, gastric to stomach, mesentery to intestines.

Bladder symptoms following hysterectomy, in which the cystoscope shows a normal bladder, are due to ureteritis and not to cystitis. Sanger in 1886 reported cases of ureteritis treated for long periods as cystitis. Judd reported a case of early pregnancy with ureteritis and spotting, which was mistaken for ectopic pregnancy. Hunner has reported a large number of strictures of the lower ureter, which were mistaken for all sorts of abdominal conditions. The Mayos report that most of the cases of kidney and ureteral stone which they encountered have been mistaken for other abdominal conditions and the patients operated upon for disease of the stomach, gallbladder, ovary or appendix. Kelly (2) states that gonorrhoea is a common cause of ureteritis and stricture.

Chronic pyelitis and ureteritis cause stricture of the ureter followed by hydronephrosis if the condition is not treated. Ureteritis due to lacerations and infections of the cervix, if treated early, will not result in strictures. In patients treated for various abdominal disorders the condition is made clear by palpation of the pelvic ureter.

EXAMPLES OF CASES.

CASE I.—R. J., aged thirty-five. Since the birth of her child five years ago, the patient had had pain

*Read before the American Association of Obstetricians and Gynecologists, Atlantic City, N. J., September 21, 1920.

in the left side of her abdomen and back, which had been very severe at times, and had also complained of frequent urination, which was painful. She was advised to have her ovaries removed, and had been treated for constipation, cystitis, ulcer of the stomach, and various other things. The examination showed the pelvic organs to be normal, the cervix was lacerated, eroded, and infected. The left ureter was enlarged and very tender; palpation brought intense desire to urinate. The injection of collargol showed the ureter to be slightly dilated just over the bladder and the kidney pelvis slightly dilated. Pain was relieved after ureteral catheterization.

CASE II.—A. G., aged sixty years, a patient of Dr. Wells; sent to New York Polyclinic Hospital. Patient complained of acute pain in right side of abdomen over gallbladder region, which was tender and rigid over right abdomen; half a grain of morphine brought only partial relief. An examination showed that the right ureter was enlarged, tender, and very sensitive, and a small stone was felt just above the bladder. Cystoscopic examination showed the right ureteral meatus to be red and swollen, and the catheter was obstructed at two cm. above the



FIG. 1.—Sagittal section of the female pelvis, showing bimanual palpation of lower end of ureter.

bladder. An injection of collargol disclosed a small stone in the pelvic ureter with ureter dilated above it; the kidney pelvis was moderately dilated. The patient was relieved immediately after examination and four days later a gallstone the size of a shoe button was passed.

CASE III.—G., aged thirty years, single. The patient had pain in the right abdomen, suffered from indigestion, and was sent to the hospital to have the appendix removed. Examination showed the pelvic organ to be normal; the right ureter thickened and tender, and pressure brought desire to urinate. Injection of collargol showed stricture just above the bladder, dilatation of the ureter above it, and small hydronephrosis. The patient was cured by dilatation of the ureter.

CASE IV.—R. S., aged twenty-two years; married four years, has one child three years old. The patient had had three miscarriages brought on by a midwife; was operated on two years ago for gall-

stones, and again a year later for adhesions of gland, bladder. She complained of pain in the right abdomen, backache, which was worse on walking, and had frequent urination and profuse leucorrhoea. Examination showed that the right ureter was enlarged and tender and palpation brought on a desire to pass urine. The cervix was found to be eroded and infected. Collargol injection showed that the ureter was slightly dilated above the bladder. Treatment of the cervix and vault of the vagina brought relief.

CASE V.—A patient of Dr. Wells, aged thirty-two years; married, with one child five years of age. Last menses had been three months before, at which time she suffered severe pain in right ovarian region, which was accompanied by spotting. The patient was sent to the Polyclinic Hospital for operation for ectopy. Examination showed the uterus to be enlarged and that she had been pregnant for three months. The right ureter was enlarged and very tender, and pressure caused the desire to pass urine. Treatment of the vault of the vagina, urotropin, and lavage of the kidney pelvis brought relief.

CASE VI.—K., aged forty years. Patient had fever, chills, and a tumor in the right side of abdomen, diagnosed by different men as gallbladder and ovarian cyst. Frequent urination was also present, and at times there were blood clots in the urine. These were attributed by different physicians to an inflamed ureteral meatus. Examination showed that the right ureter was much enlarged and tender, and a cystoscopic examination showed that the bladder was normal and the right ureteral meatus reddened and contracted. An injection of collargol revealed a soft stone in the kidney pelvis about the size of a plum, which had not been shown by the x ray. The large pus kidney with a very soft stone was removed.

CASE VII.—I. R., aged twenty-five years; married three years. The patient complained of pain in the right side which was made worse by walking, of indigestion and of constipation. The appendix had been removed without giving relief, and the patient was told to have the ovary removed. Examination showed that the right ureter was enlarged and very tender and palpation caused an intense desire to pass urine. A small, hard mass, believed to be a stone, was felt at the entrance of the ureter into the bladder. The cystoscope revealed a small reddish brown stone sticking out of the ureteral meatus. An x ray showed that there was a stone half an inch long at the entrance to the bladder. A few days later, the x ray revealed a stone two inches higher up in the ureter. At the first examination it was impossible to dislodge this stone, but upon dilating the ureter the stone passed.

CASE VIII.—M. K., aged thirty-seven years. Another surgeon operated on the patient two years ago for tuboovarian abscess. For the past year there had been pain in the left kidney and abdomen, frequent urination—every half hour at night—and the pain had been most severe lately. Examination showed that the uterus was slightly fixed and the left ureter thickened and tender. Palpation brought on intense desire to urinate, and there was pain in the left kidney region. Cystoscopy showed that the left meatus was contracted and retracted, and the

atheter was obstructed at six cm. from the bladder. The ureteral meatus contracted, but no urine passed. An operation was performed and a small hydronephrotic kidney, lined by thickened membrane, was removed.

CASE IX.—J. M., aged thirty-five years. Since the birth of her last child, three years ago, the patient had suffered from indigestion, pain over the right kidney and right abdomen. Frequent and sometimes painful urination was present at times. She was treated for cystitis and advised to have the appendix removed. Pain in the region of the ovary was present during the menstrual period. Examination showed that the pelvis was normal, and the right ureter enlarged and tender. Palpation caused intense desire to urinate. The cervix was lacerated, eroded and infected. The cystoscope revealed a normal bladder and collargol injection showed the ureter to be dilated three inches above the bladder. Treatment was given to the cervix and vault of the vagina.

REFERENCES.

1. JUDD: *American Journal of Diseases of Women*, vol. xxii, No. 6, 1916.
2. KELLY: Kelly and Burnham, p. 352.
240 RIVERSIDE DRIVE.

THE VALUE OF ABDOMINAL EXERCISES BEFORE AND AFTER DELIVERY.*

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Considering the enormous amount of attention paid to the development of prophylactic measures in gynecology and obstetrics, it is rather surprising that so little work has been done in the direction of improving the tone of the abdominal muscles; particularly so, when it is universally conceded that the element of muscular activity, as a factor in the mechanics of labor and in the maintenance of good health at all other times, it is a matter of utmost importance.

Everyone is familiar with the flabby, flaccid, pendulous abdominal wall, which cannot be counted on as an asset during parturition, and which is distinctly a liability during the nonparturient period, being a causative factor in the production of ptoses of the abdominal viscera. During labor such an abdominal wall plays a negligible part in assisting the expulsive activity of the uterus; indeed, in many instances the relaxation encountered is so great that it allows of marked deviation of the uterus from the axis of expulsion. At all other times, a wall of this character offers no support to the abdominal viscera, the continued absence of this support ultimately resulting in the acquired form of visceral ptosis.

Remembering that the abdominal walls of the type previously described belong almost always to multiparæ, and also that not all women who have born children have visceral ptoses consequent to re-

laxed abdominal walls, the quest for the causative factor narrows down to the relation of the amount of strain to the quantity and quality of muscle.

In the normal state the muscles extending from bone to bone are slightly stretched. This state of elastic tension insures a more prompt and effective contraction, as

shown experimentally by the fact that the amount of rise of a lever to which a muscle is attached, when excited by an electrical stimulus of definite strength, is greater when the muscle is placed under tension

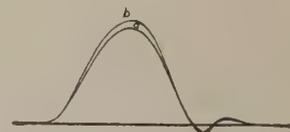


FIG. 1.—Record of contraction of frog's gastrocnemius muscle; myogram, a, muscle not weighted; myogram, b, muscle carrying a load of five grams.

by adding a slight weight, than if no weight is added (Fig. 1). Muscle is extensible and perfectly elastic within limits. The extensibility of muscle for successive equal increments of weight gradually decreases, approaching zero as a limit. Before that limit is reached, removal of the weights results in a perfect elastic recoil. If the weight is increased beyond the zero limit, which is also the elasticity limit, the amount of extension then increases with increasing increments of weight up to the rupture point, and elastic recoil from beyond the elasticity limit is not perfect (Fig. 2).

Frequently an abdomen is seen, the wall of which is under tension only while the woman is in the upright position. When she is placed in the dorsal recumbent position, the loose redundant wall spreads over the flanks and the pubes. It is evident that the tonus in these muscles is low and also that they have previously been stretched beyond their elastic recoil limit. That wall does not support the abdominal viscera, and is one of the most frequent causes of the acquired form of visceral ptosis. A saggital section of the body shows the outline of the abdominal cavity to be somewhat pearshaped with the large end uppermost. The posterior wall, consisting of the psoas muscle and a fat pad, is inclined backward from below upward at an angle of about fifty degrees, and it forms a padded shelf which helps to support the organs of the upper abdomen. Its value, however, depends upon a firm anterior abdominal wall, because the inclination is so steep that unaided by any other force than the mesenteric attachments the heavy organs would tend to slide downward. The force of the anterior abdominal wall being exerted inward

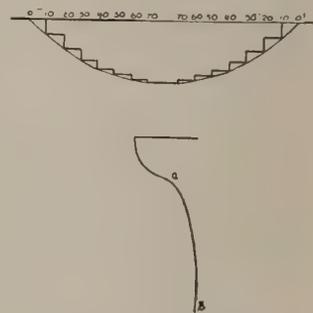


FIG. 2.—(Above) Gradient of extensibility and elasticity for ten gram weights, before elasticity limit is reached; (below) gradient of extensibility continued beyond elasticity limit a, rupture point at b.

and that of the posterior wall diagonally upward, the resultant of the two forces is applied in a direction best calculated to give support (Fig. 3).

Recognition of these facts has resulted in palliative efforts through the use of various anterior rein-

*Read before the section on Gynecology and Obstetrics of the New York Academy of Medicine, January 26, 1920.

forcements, pads, and bandages, with considerable success. Such relief, however, is not permanent. When the mechanical support is removed, the symptoms recur because nothing has been done to strengthen the muscles which have lost their natural elasticity after having been subjected to a period of increasingly forcible extension, exceeding the

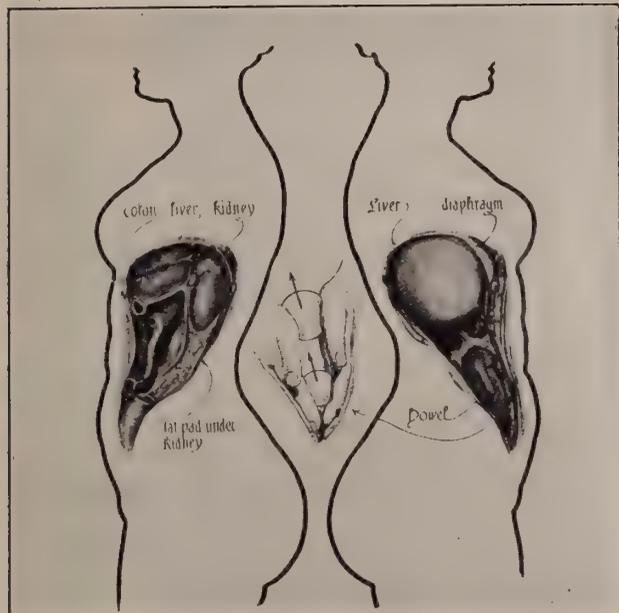


FIG. 3.—Support of the organs of the upper abdomen by the abdominal wall.

limit of physiological extensibility with perfect elastic recoil.

The careful analysis of obstetrical case records yields as one of the conclusions the belief that many forceps deliveries might have been avoided by the application of a tight abdominal binder. The proper development of the muscles of the abdominal wall before pregnancy will obviate the use of an abdominal binder. If the tone of these muscles had been raised sufficiently before pregnancy, the wall would yield less readily and less completely to the gradually increasing pressure of the enlarging uterus, and their synergistic rhythmic contractions during the uterine expulsive efforts would furnish valuable aid. A point in the improvement could also be reached which would allow a margin of extensibility beyond that encountered in the parturient period without reaching the elastic recoil limit, and thus insure perfect elastic recoil.

Progressive muscular exercise can raise the quality of muscle to a higher standard of efficiency. That the elastic tension of any muscle may be increased by exercise, has been demonstrated beyond controversy. This is well exemplified in the partial flexion during rest of the forearm of the blacksmith, and the great degree of flexion of the phalanges of the trained weight lifter or the day laborer. Before maternity, therefore, the abdominal muscles should be prepared for the expected strain by raising their power through progressive exercise, increasing the limit of extensibility with complete elastic recoil, beyond the amount of extension encountered in pregnancy. In the case of muscles already relaxed, their tone must be increased and a

corresponding diminution in muscle length obtained, to secure a wall which will offer resistance to the tendency of the viscera to prolapse, and which will also be a valuable aid in subsequent pregnancy.

An exercise is here suggested which is ideal, inasmuch as it meets with all requirements regarding results, is capable of universal application because it can be practised at home without apparatus, and presents a wide range of gradation of effort necessary for its accomplishment, thus making it applicable to individuals having different strengths of abdominal walls.

With the patient lying flat on her back, the entire lower extremities from the hips down, acting like a single lever, are flexed on the abdomen to a line perpendicular to the resting surface, and then lowered (Fig. 4). Throughout the exercise there should be no flexion at the knee joints. This movement should be repeated as many times as possible and the number noted, at each succeeding trial, strenuous effort being made to increase the number of movements. This exercise should be practised in the morning, before dressing, or at bedtime, the former, however, being preferable, as it is then not superimposed on the arduous labors of the day.

When the exercise is first attempted, the average woman will find difficulty in repeating the manœuvre twenty-five times without pause, but it is astonishing to note the rapidity of increase possible, and the concomitant improvement in muscular tone. For the flabby, muscularly unfit woman, who might not be able to perform the exercise properly even once, the simple modification of allowing slight flexion at the knee joints, brings it within the range of her possibilities, and in her case, the first aim of progression should be the development of enough power to perform the exercise without flexion. An expen-



FIG. 4.—Flexion of lower extremity on the abdomen.

diture of no more than four minutes is necessary for the performance of the movement one hundred consecutive times, which is all that is needed ultimately to develop a firm, elastic, supporting wall. There is no reason why the abdominal muscles of woman should not be at least as well developed as those of man, and the faithful performance of the movement described above, daily for the period of a year, will develop in woman an abdominal wall similar to an anatomical cut.

With renewed interest, on the part of the specialist in diseases of women, in the development of the abdominal muscles, the indication for the use of forceps, pituitrin, and the abdominal binder will arise less frequently, and one of the etiological factors in the acquired form of visceral ptosis become negligible.

721 EASTERN PARKWAY.

PERIODIC HEADACHES OF OVARIAN ORIGIN.

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In the fall of 1916 a married woman aged thirty-eight years came to me, seeking relief from headaches. This patient was a second wife, having two children of her own. The headaches of which she complained dated back over many years, but had become very troublesome only in the last few months. They were coincident with the menses, beginning slightly before and lasting five to seven days. Sometimes a less severe headache would appear half way between her periods. The headaches were always exaggerated by social responsibilities, and by art work in which the patient engaged considerably, although these factors never provoked headaches at other times. On further questioning the fact was elicited that these headaches were entirely absent during pregnancy. Here is a patient whose headaches are definitely associated with the menstrual function, who has no headaches when that function ceases because of pregnancy and who has recurrence after its termination. Some chemical or possibly some hormonal change is obviously implicated in, and is possibly the cause of, these headaches.

What holds them in abeyance during pregnancy? Is there in this patient some endocrine deficiency periodic in recurrence, during the nonpregnant state which is fully supplied during the period of gestation? My attention was at once centered upon the production of the corpus luteum as the possible and probable explanation of this phenomenon. So definite and suggestive was the history that I immediately determined to administer dried corpora lutea. Five grains of a standard product was given in capsule form three times a day. The patient was instructed to continue this until a perceptible result was obtained and after that to reduce the dose for the next two weeks after each period, but return to the full dose twelve to fourteen days prior to the period. After three months the patient returned, reporting that the headache occurring with the first menses after beginning treatment was not so severe as usual. The second one was but slight, and there was no headache at all with the third period. The patient did not come again for five or six months. At this third visit she reported that she had stopped the medicine entirely after the third month of treatment and that she had no headaches for about three months more, when a recurrence took place and the medicine was resumed.

For a few times she took the medicine before each period and has had no headaches since the first recurrence. Over two years from the begin-

ning of treatment the patient reported that she had taken no capsules for a year and had had no menstrual headaches.

Since treating this first patient I have treated about twenty-five women with headaches of this type. The results have been highly gratifying. With the majority of patients, however, it seems to be necessary to repeat monthly a brief course of corpora lutea prior to each menstrual period. Some require larger doses than others and for a longer time before the menses. The treatment has never provoked an increased flow or any other untoward symptoms. One patient about thirty-nine years of age, who had had menstrual headaches for many years, summed up the result of three months' treatment by saying, "Life is now worth living. I wish I could have had this years ago."

A trained nurse who had three children took the corpus luteum negligently for two months and stopped it, feeling she received little benefit commensurate with the expense. Later her headaches returned with the usual severity and she resumed the medicine, obtaining by more continuous dosage full satisfactory results, although when last heard from she had to take the capsules every month.

Having spent about twelve years in institutional work, where I came in contact with many forms of chronic headache, and having seen these cases treated on the supposititious etiology of autointoxication and Haig's uric acid diathesis by most thorough and rigid dieting, eliminative hydrotherapy and everything else a sanatorium régime could bring to bear upon such cases, all with very slight or no results at all, I naturally became very sceptical of the possibility of benefit from any form of therapy. The result of corpus luteum feeding has been so uniformly satisfactory and the apparent physiological basis so definite clinically that the results seem to be well worth recording. A specialist has assured me that there is, up to this time, nothing at all recorded in the literature along this line in the treatment of periodic headaches.

In order to obtain definite results the cases must be carefully selected, discarding all that do not fall under the definite symptomatology and course outlined below. This type of headache always occurs, in the first place, with some definite time relation to the menses. It may be during the period only. It may begin a few hours or even a week before the period. In some cases it always comes after the close of the menstrual flow. However, these latter cases are less common and in my experience give somewhat less complete results. In some patients an intermenstrual headache occurs with quite definite regularity and in others it is both menstrual and intermenstrual in time.

These headaches, which for want of a better designation I have called periodic headaches of ovarian origin, never occur during pregnancy. This feature has been absolutely uniform in those women who have borne children or who have had children since the inception of this type of headache. This was especially definite in the case of one patient who had had four children and in whom the headaches were very severe and of many years' standing. During pregnancy she was free from headaches.

A third feature of these headaches is that they become worse as the patient approaches the menopause and reach their maximum with the usual height of the nervous symptoms of this period of life. Some patients are not troubled until after their thirty-fifth year. Others give a history of such menstrual headaches from puberty or within a few years thereafter. In two or three cases severe headaches antedated puberty by five years or so, and after puberty seem to become merged in the menstrual headaches and appear thereafter largely to be of this type. Such patients have headaches at other times than those which bear a definite time relation to the menses. These latter, however, are never missed.

Periodic headaches of ovarian origin cease after the full completion of the ovarian atrophy of the climacteric. The cessation of such headaches will therefore occur after the operative removal of the ovaries for any cause whatsoever and will be very materially hastened by proper dosage of x ray or radium.

When very severe, this type of headache is usually accompanied by nausea and vomiting, beginning several hours after the onset of the headache. For this reason women often speak of them as sick headaches. Care should be observed that this does not lead to confusion with other forms of headache associated with nausea or vomiting, or both.

In connection with the subject of periodic nervous disturbances of apparent ovarian origin, the history of the following case now under treatment may be instructive and possibly offer a suggestion for the endocrine therapy of other nerve disturbances associated in certain cases with the periodic function of the ovaries or uterus.

CASE.—A single woman, thirty-two years of age, with negative family history as regards nervous or mental disorders, gives the following personal history. She was well up to nineteen at which age the catamenia began. These were regular at a twenty-eight day interval and of three day type. With each period she suffered from severe headaches and pelvic pain, both of two weeks' duration, beginning one week before and lasting one week after the period. For twenty-four hours at the beginning of the menses the pelvic pain was extremely severe. There was a free interval of two weeks. This programme continued for four years, when convulsions began to occur from one to four times during the week of headaches preceding each period. The convulsions became worse during the next four years. The left ovary was found to be cystic and was removed. Its size was almost that of an orange. The patient was then twenty-seven years old. For nearly three years following this operation the patient was free from headaches and pelvic pain and had no convulsions. She then had convulsions at two different periods, after which the right ovary was removed. It was reported that this ovary was not cystic. This was in the patient's thirtieth year. She was then again free from all symptoms for two years until August, 1919, when the same symptoms—headache, pain and convulsions—reappeared, though in milder form than before. The latest symptoms have been of two weeks'

duration, periodic in recurrence, which is four weeks from the beginning of one to the beginning of the next. She has had no menses since two years ago, when her second ovary was removed. When the time came for a third attack of this series she rested in bed one week and all symptoms were absent except pain in the right side centering about McBurney's point. Her appendix was removed at the second operation, but examination shows marked tenderness in this region.

Treatment with five grains of corpus luteum three times a day was begun and the patient ordered to rest with each periodic recurrence of the former menstrual dates. August 31st, one month from the beginning of treatment, the patient reported that she passed an entire week at the usual period without symptoms. She had rested as much as possible, which, however, was not in bed nor at all complete. The side was still sore. In September, four examinations revealed tenderness slightly internal to McBurney's point and above along the approximate course of the right ureter. As the urine showed pus hexamethylenamin and monobasic sodium phosphate were prescribed.

In October the patient had a convulsive attack not observed by anyone. She has not followed the prescribed rest, but has worked fairly steadily as usual. In January, 1920, an attack occurred which lasted a few minutes only. A friend reported that the attack in May, before treatment was begun, lasted about forty minutes, i. e., that the twitching of the muscles continued during that time. The July attack, also before treatment was begun, lasted twenty minutes. In addition to having attacks of lesser severity and shorter duration, the patient reports that these last attacks, since beginning the corpus luteum, have left her feeling well and ready for work without headache, whereas prior to this the three attacks at the first of this series ended in a headache and several days of indisposition. It will also be noticed that while a monthly periodic disturbance with headache and pain still occurs, the convulsions have not occurred every month, but when they have appeared it has been bimonthly both before and since treatment was begun.

From January to October, 1920, the patient has had but one convulsion. This was a very mild one without aftereffects. It occurred at the beginning of a menstrual date which had been preceded by a two hours' session in the dentist's chair. With this exception there have been none of the usual symptoms for nine months. The patient feels better and works regularly, usually eight hours a day. She continues to use the corpus luteum three times a day.

There are several interesting questions that may be propounded regarding this particular case: 1. What structure in her body maintains her periodicity of symptoms exactly coinciding in time with her former menses? 2. To use endocrine phraseology, did she not have an ovarian struma with dysovarianism or hypoovarianism? 3. Was the epilepsy directly due to any endocrine disorder or only to excessive nerve irritation arising from severe headaches and pelvic pain? 4. Were not the headaches of the same type as those under discussion, viz., periodic of dysovarian etiology?

Editorial Notes and Comments

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NEW YORK, SATURDAY, NOVEMBER 6, 1920.

A NEW ERA IN GYNECOLOGY.

It is not so far back that the study of gynecology assumed enough importance to rank as a specialty. With the coming of each specialty some of the more farsighted were fearful that the person surrendered to the care of the specialist for diagnosis and treatment would cease to become an individual and would go through the stages of being a patient, a case, and finally go down into the records as a history number; the features of the malady which were of especial interest to the specialist would help swell the statistics and these would be added to the formidable list with which he was armed. These statistics, when brandished before the less fortunate practitioner who seldom saw more than a few of the variants of certain maladies, did much to overawe him. The specialists increased. The fields became ever more narrow and those philosophers found among medical men from time to time shook their heads dolefully as they saw this change and witnessed the passing of the individual, while the microscope was trained upon the patient. The patient was measured and weighed in the laboratory and with the focusing of the picture on a small detail the entire background of the patient's personality, makeup and environment was blurred. The operations were more and more successful, but was the patient benefited?

With the growth of the specialty of gynecology came other specialties in other fields. Psychiatry grew by leaps and bounds and established itself on a more substantial basis, with the possibility of the

exploration of the unconscious made possible by the work of Freud. Endocrinology, entrusted for a time to the laboratory, more recently has been invading the wider field of practical therapy. Once the results of its application were seen, the new science flourished like a flower allowed to see the sun, and yet these studies are practically in their embryonal form. Then Adler [*The Study of Organ Inferiority, Nervous and Mental Disease Monograph Series*] presented his most valuable hypothesis of organ inferiority and the various psychical and physical compensations which took place.

Now, the question may be asked, What has all this to do with the new era in gynecology? The answer will be found in the splendid paper by Graves in this week's issue of the NEW YORK MEDICAL JOURNAL, in another paper by Bandler which will appear in next week's issue, and in other papers by him which we have been fortunate enough to publish. Other papers which appear in these special gynecological numbers show signs of this new movement. These men have begun to realize how important it is to look upon the patient as an individual, to consider the general background and the endocrine status of the patient. They have begun to realize that many factors must be considered when an attempt is made to find the cause of a disordered cycle of menstruation. The pituitary, that tiny gland which controls the rhythmicity of bodily functions and the appreciation of rhythm, may be at fault. Psychic disorders originating in unfulfilled wishes, which seek a somatic outlet as a manifestation, may be causing havoc. Or the body may be marshalling its armies of defense against an anemia which in turn may have any one of many causative factors.

This is only given as an example. The lesson may be carried on to every branch of the complex specialty of gynecology. A few of the more progressive men have realized the importance of considering all the factors which may enter into a given case. First of all, the entire picture must be in focus, then the finer details may be explored and elaborated. If necessary a part of a patient may be sent to the laboratory as an aid in diagnosis, but the patient as an individual must always be before our eyes. For this reason the philosophers who prophesied that the specialists would find themselves in blind alleys may be reassured. The work of synthesis has begun before analysis became too minute. The architect must know the strength of each beam and girder, but he must not lose sight of the structure as a whole.

RICKETS AND THE VITAMINES.

Rickets is one of the diseases believed by many investigators to be due to a deficiency of the vitamine element. There is, however, another band of observers who believe in the prime importance of defective hygiene in its etiology and yet others who hold the theory that the condition is brought about, not only by a deficiency or lack of vitamins but by a deficiency of certain articles of diet which produces ill balanced metabolism. Hess and Unger undertook a series of clinical experiments, the results of which were published in the *Journal of the American Medical Association*, 74, 1920, which appear to show that deficiency in the fat soluble vitamine has little to do with the causation of rickets.

In a paper read before the British Medical Association recently, Dr. F. Gowland Hopkins, professor of biochemistry in the University of Cambridge, subjected these experiments to criticism. He remarked that though they were of considerable importance, they failed to set the question at rest and he was struck with the exceptional constitution of the diet upon which infants were placed when it was intended to create a vitamine deficiency. He pointed out that in respect of rickets developing in the infants when they were placed on an apparently normal fat supply, no full analysis of the cases was given. Only two cases were mentioned in detail. The most striking of these, one in which rickets developed in the child while it was on a very full supply of whole milk, showed at the same time some added abnormality because the generous milk diet, with the addition of spinach, failed to produce growth.

Hopkins thought it was noteworthy that the rickets was cured and growth became normal when at the thirteenth month codliver oil was added. On the other hand the five children in whom rickets did not develop, although their food was presumed to be highly deficient in the fat soluble vitamine, were given a diet of an extremely high total caloric value, containing, together with a vegetable fat, a large daily ration of a skim milk powder. Hopkins was of the opinion that to contrast the nutritive effects of skim milk, fortified with vegetable fat, with those of whole milk, was doubtless a legitimate method of testing the influence of the fat soluble vitamine, so long as both milks were administered in normal amounts. But he drew attention to the fact that skim milk was by no means free from the so-called fat soluble substance. He had experimental evidence to show that highly separated milk contained an amount decidedly in excess of what the residual fat would seem to indicate. When, then, so large an amount as 180 grams of a milk powder, equal to

nearly two litres of the original milk, was daily administered, as in Hess and Unger's experiments, in infants aged from four to nine months, the supply of the fat soluble vitamine was far from being negligible. Therefore, Hopkins deemed that valuable as this clinical study might be, he did not think it brought evidence that was final.

It does seem certain, that the more investigations undertaken to determine the causation of rickets, the clearer it becomes that more than one factor is concerned in its causation. Too great stress has been laid on the vitamine element, just as too much emphasis has been placed on defective hygiene in the etiology of rickets. Each plays a part, and the dietetic factor is not confined to the vitamine content of the food. The point that requires study now is the relative importance of each factor.

 PHYSICIAN-AUTHORS: DR. OLIVER
GOLDSMITH.

It requires a stretch of the imagination, perhaps, to include Oliver Goldsmith in a list of author-physicians, for the truth is that Goldsmith's medical skill was of a low grade, and as for patients, the records show he never was able to get any worth mentioning. "I do not practise," he once said; "I make it a rule to prescribe only for my friends." "Pray, dear doctor," said Beauclerk, "alter your rule and prescribe only for your enemies." Goldsmith took up medicine only after he had failed at several other professions—including the ministry, the law and teaching. He spent eighteen months at the medical school of Edinburgh University and about the same length of time at Leyden University. As an indication of how much of that time he devoted to study it need only be mentioned that some time later when he presented himself at Surgeons' Hall for examination for the humble position of "mate to an hospital" he was unable to pass. Goldsmith laid claim to having received a medical degree somewhere on the Continent—but not at Leyden. If so, no one has ever been able to find a record of it. When he left Leyden he rambled through Flanders, France, Switzerland and Italy playing a flute for his meals. When he returned to London he tried to build up a practice but failed miserably. Instead, he became a strolling player, and the life of a strolling player in those days was a dog's life indeed. Later he pounded drugs and ran errands for chemists. A friend once got him a medical appointment in the service of the East India Company, but this was speedily revoked when it was found that he was incompetent and wholly unfitted to do the work.

And yet, in spite of all this, Oliver Goldsmith prided himself on his medical knowledge and, even after his literary successes, preferred to be known as a physician. He invariably signed himself "Dr. Oliver Goldsmith" and had such confidence in himself that for several weeks at the beginning of his last illness he prescribed for himself and refused to let a real physician take charge of his case. After his first failure as a physician in London Goldsmith had worked for a short period as a bookseller's hack, and when he failed to qualify as a hospital mate there was nothing for him to do but return to this lowest form of literary drudgery. So, at the age of thirty, Macaulay tells us, he sat down amid squalid surroundings to toil like a galley slave. And in time he became perhaps the most beloved of English writers, a position he held for many decades, and comes mighty near holding it even today.

During these and later hack days Goldsmith wrote a little of almost everything—several volumes of translations, innumerable essays, many poems, a *Life of Beau Nash*, histories of England, Rome and Greece, a *History of the Earth and Animated Nature* in eight volumes, and other writing of various sorts. In the compilation of his histories he was a master of selection and condensation. His style was pure and easy, his humor rich and joyous, and his descriptions picturesque. Practically all this work was published anonymously, but in spite of this Goldsmith was becoming a popular author. A series of lively sketches of London life and narratives of his Continental rambles, in particular, aided in attracting attention to him. Then, too, he was doing at intervals during this period some of the work which made him famous and prosperous. But prosperity didn't help Goldsmith much; it merely served to hasten his demise, and when he died he was ten thousand dollars in debt. He has been described as vain, sensual, improvident and frivolous. Horace Walpole called him "the inspired idiot" and Samuel Johnson said: "No man was more foolish when he had not a pen in his hand or more wise when he had. But let not his frailties be remembered. He was a very great man." Goldsmith was one of those men of whom we say, "He was his own worst enemy." He was a curious compound of absurdity and folly. He spent lavishly, gave freely and was an unlucky gambler. His average income for the last seven years of his life was more than four hundred pounds a year, which was opulence in those days, but he squandered it as fast as he got it and died in debt. He had to sell *The Vicar of Wakefield* to pay his room rent and got only three hundred dollars for this novel which charmed all Europe and is still a big favorite.

Goldsmith's poem, *The Traveler*, was his first signed work. It is one of the finest poems in English literature. While the fourth edition of *The Traveler* was being published *The Vicar of Wakefield* appeared and rapidly attained immense popularity. Critics says it is one of the worst stories ever constructed, but its faults are offset by its vivacious comedy. After its appearance Goldsmith turned to the drama. His first effort, *A Good Natur'd Man*, was actually too funny to succeed, for that sort of comedy was unfashionable at the time. His second great poem, *The Deserted Village*, appeared next, and this was followed by his second play, *She Stoops to Conquer*, an incomparable farce which marked the high tide of his prosperity and popularity. Goldsmith's other notable work includes his poems, *The Hermit* and *Retaliation*, both replete with humor and charming imagery.

Goldsmith was born in Ireland, of English parents, in 1728. A relative taught him his A B C's and for two years he attended a school kept by a retired soldier. Thereafter he attended some grammar schools and was the butt of ridicule of both pupils and teachers because he was so homely and such an incorrigible dunce. Later he went to Trinity College, Dublin, where he was invariably at the foot of his class but managed to get a bachelor's degree in 1749. His father, who had died while he was at Trinity, was a minister; the son applied in a scarlet coat for a ministerial berth, and was turned out. He next tried his hand at tutoring and failed, and his despairing relatives tried to pack him off to America. They gave him one hundred and fifty dollars and a good horse and started him off to Cork. He spent the one hundred and fifty in revelry and the ship sailed without him, and Goldsmith turned up again like a bad penny. He next tried the law, in Dublin. An uncle gave him two hundred and fifty dollars to start with. He gambled the money away in a few days. And then he went to Edinburgh. Goldsmith died on April 4, 1774, in London, of a nervous ailment brought on by those habits of life which made him such a conspicuous failure in everything except as a writer.

MILK

Milk is such a dangerous food, or has the possibility of being such, that some of our best sanitarians hesitate, in their own households, to use that furnished by the finest dairies in the country without its previous pasteurization. In the light of some epidemics that have been traced to the doors of these dairies, they are justified in this attitude of distrust of the raw product. Happy is the consumer of milk

who knows nothing of bacteriology, but the one who has tasted of the fruit of the tree of the knowledge of such forms of life, must have a damper put on his appetite for the lacteal fluid. At best it is a contaminated, if not a dangerous food. When the high proportion of tuberculous cows resident in some of our states is considered, the number of cases of tuberculosis in children which may have been derived from milk is truly alarming. We know little indeed of the sources of tuberculous infection at a later age, but if, as has been suggested, the disease in the adult is due to infection in early childhood the food supply of that period comes in for close scrutiny.

A prominent English physician, Campbell, has proposed that, after the period of infancy, milk should be dropped from the diet as no longer needed and because of the high element of danger in its use. He has excellent example for this in that the young of animals get along without, or can get along without, milk after their early days. Certainly man, before he learned to take advantage of the cow, had no milk after his first year or so.

On the other hand there is much outcry, on the part of food specialists, about the need for vitamins which are contained in milk. There is no question about the presence and the value of these substances, but is it so essential that they be obtained from milk? If so it would seem as if we had lost the ability to utilize these substances from other sources. Considering the danger of infection which exists in even the best of milk we are much in need of the real facts in the case as to whether it is essential for the human being in other than the earliest months. At least, however, we can feel assured that milk which has been carefully pasteurized or has been boiled is above suspicion of danger, and all efforts to improve the milk supply of a community should receive the heartiest support of all concerned in the promotion of health.

FREE USE OF MEMORY.

Repression is manifest in a timid reluctance to engage in health stimulating pursuits. It is not the distinct positive phobia alone which shows the effect of the choking back of psychic energy. The acute distress, the vaguer pain that realizes itself only in restless inaction, these are familiar marks of repression. And repression builds itself upon the want of courage to seize knowingly upon one's memory store. Because of the cutting out of the latter there is no vigor with which to turn to action, no flaming energy to outleap the ashbed of despair.

More and more the duty of discovering the reasons for such cutting off of the larger part of the self presses itself as a primary one of medical

practice. This is psychoanalysis. Bergson in *Mind Energy* hints at the hidden material which "in reality" lies "concealed in the depths of memory." He is not interested, however, in this book in the inner pathological aspect of the problem of unavailable memory material. He rather pours illumination upon the final end and goal of psychoanalysis, the gain to life if memory is free. Access to unconscious material is power and quickening inspiration where once was listlessness or active despair.

Bergson's conception of the brain in its higher areas is that of an organ at the service of conscious choice interposed as a screen against a flood of unconscious intruders, but at the same time a machine through which selective admission is gained. Thus memories obtain egress to enrich the situation in hand. This selection and admission must not be hindered by such weighting down of these memories that they cannot emerge.

The man of action is the opposite of the timid soul who dares not act, or the possessor of such positive fear, projected result of the unconscious weight, that there is no room for endeavor. Energy released no longer drives tortured nerves to forbidden and therefore impossible action. Such action would be only anyway a repetition of past conceived desires which memory stores. Free of admission to a constructive consciousness these memory images become reshaped to newly created uses. With such freedom therefore the man of action goes out to leave "his mark on the events in which chance has called on him to take part." Free behind his conscious present moment, free ahead of it, he is able to guide his action through a "momentary vision which embraces a whole course of events within one purview." His ability, his stimulus toward the future owe themselves to this wholeness of his mental life—and wholeness is also healthy exuberance. "The greater his hold on the past in his present vision, the heavier is the mass he is pushing against the eventualities preparing. His action, like an arrow, flies forward with the greater force the more tensely in memory his idea had been strung."

SIMULATION AND THE CAMERA.

Clever simulation requires a larger amount of selfcontrol and study of the emotions than the average faker possesses. A little faradic psychotherapy, restriction of food, isolation, generally bring the man to confession. At one war clinic where simulations of mental deficiency, deafness, and other conditions were common as an excuse to avoid military service, frequent photographs were made; every mood, every attitude was recorded; the pictures, if simulation was present, bore

no consecutive likeness to the symptoms asserted. In the first the man would be worried, confused; in another indifferent, melancholy; in a third expectancy would be betrayed as to the success of his simulation. On being shown the many photographs and the impossibility of so many mental conditions being coexistent, the expected confession was nearly always forthcoming.

News Items.

Nobel Prizes Awarded.—The Nobel prizes in medical science for 1919 and 1920 have been awarded to Dr. Jules Bordet, of Brussels, and Professor August Krogh, of Copenhagen.

California Health Officers to Meet.—The state, county, and municipal health officers of California will hold their annual conference in Chicago, on November 8th to 11th, under the presidency of Dr. Ernest H. Pape, of Berkeley.

Gift to Red Cross Society.—By the will of Emma Chambers Jones, of New York, who died in Grafton, Mass., on September 18th, the American Red Cross Society will receive \$10,000. The Charities Organization Society will also receive \$10,000.

Gift to Presbyterian Hospital.—By the will of Adèle Emilie Flint, of Larchmont, the Presbyterian Hospital of New York will receive \$100,000. Another beneficiary is the Society for Improving the Condition of the Poor, which receives \$25,000.

Bronx Maternity Hospital Dedicated.—The new \$100,000 building of the Bronx Maternity Hospital, at 168th street and the Grand Concourse, was dedicated with suitable ceremonies on Sunday, October 30th. The institution is now open for the reception of patients. The building will accommodate forty beds.

Public Health Lectures.—The School of Hygiene and Public Health of the University of Pennsylvania announces a course of ten lectures on public health problems, at the University of Pennsylvania during the coming term, which will be open to the public. The first lecture in the course will be given Saturday evening, November 6th, on the Objects, Aims, and Results of Medical Inspection of Schools.

Clinical Congress of American College of Surgeons.—The tenth annual session of the Clinical Congress of the American College of Surgeons was held in Montreal, October 11th to 15th. Dr. John B. Deaver, of Philadelphia, was elected president, to succeed Dr. George E. Armstrong, of Montreal, and Dr. Harvey G. Mudd, of St. Louis, and Dr. Charles E. Sawyer, of Marion, Ohio, were elected vice-presidents. The secretary and treasurer were reelected.

American Hospital Association.—At the annual meeting of this association, held in Montreal, October 4th to 8th, the following officers were elected: Dr. Louis B. Baldwin, of Minneapolis, president; Dr. George O'Hanlon, of New York, president-elect; Dr. Malcolm T. MacEachern, of Vancouver, B. C., Mr. S. G. Davidson, of Memphis, and Miss Alice M. Gragg, of Louisville, Ky., vice-presidents; Dr. A. R. Warner, of Chicago, secretary, and Mr. Ara Bacon, of Chicago, treasurer.

Red Cross Establishes Health Centres in New York.—According to reports issued by the Red Cross Society, substantial headway has been made in the health program of the organization, eighteen health centres having been established in the Metropolitan District of New York and in New Jersey and Connecticut.

Hahnemann Hospital Association.—A meeting of homeopathic physicians and others was held in New York, Thursday evening, November 4th, for the purpose of considering how best to carry on the work of the hospital as was originally planned when the institution was established. The Hahnemann Hospital Association was organized with this object in view.

Civil Service Examination for Anesthetists.—The United States Civil Service Commission announces an open competitive examination for anesthetist, to fill a vacancy in Freedmen's Hospital, Washington, D. C., at \$1,200 a year, plus increase granted by Congress of \$20 a month, with board. Freedmen's Hospital is an institution for the treatment of colored patients. Applications will not be received after December 7th.

\$3,000,000 Police Hospital Planned.—It is announced that one of the largest and best equipped hospital buildings in Greater New York will be erected shortly in the Eastern Parkway district of Brooklyn for the benefit of the Police Department of New York. It is estimated that \$3,000,000 will be required to erect and equip the necessary buildings and a drive to obtain the money is contemplated.

Faculty Changes at Yale Medical School.—Dr. George Blumer, formerly dean of the faculty, has accepted a temporary appointment as clinical professor of medicine at Yale Medical School. Dr. Wilder Tilleston, of New Haven, has been named assistant to Dr. Blumer, and Dr. Edward H. Hume, dean of the medical school of Yale-in-China, home on leave of absence, will serve as visiting professor of medicine. Dr. John E. Lane and Dr. Alfred G. Nadler have been appointed clinical professors of dermatology.

Coming Meetings.—The fourteenth annual meeting of the Southern Medical Association will be held in Louisville, Ky., Nov. 15th to 18th, under the presidency of Dr. Edward H. Carey, of Dallas, Texas.

The eighth annual meeting of the North Pacific Surgical Association will be held in Spokane, Wash., December 10th and 11th, under the presidency of Dr. John H. O'Shea, of Spokane.

The Western Surgical Association will meet in annual session in Los Angeles, December 3d and 4th, under the presidency of Dr. Arthur T. Mann, of Minneapolis, Minn.

The Southern Surgical Association will hold its annual meeting at Hot Springs, Va., December 14th, 15th, and 16th, under the presidency of Dr. Willard Bartlett, of St. Louis, Mo.

The Medical Association of the Southwest will meet in annual session in Wichita, Kan., November 22d, 23d, and 24th, under the presidency of Dr. E. F. Day, of Arkansas City, Kansas.

Personal.—Dr. Casey A. Wood, of Chicago, has gone to British Guiana, where he will conduct research work in comparative anatomy of the eye, with special reference to birds.

Dr. Thomas R. Brown, of Johns Hopkins University, has returned from Europe, where he spent a year as director of the department of medical information for the League of Red Cross Societies.

Dr. William B. Cornell, diagnostician of the New York State Department of Education, is conducting a survey of mental deficiency in Maryland, under the direction of the National Committee for Mental Hygiene.

Dr. Ludwig Hektoen and Dr. Peter Bassoe, of Chicago; Dr. Lewellys F. Barker, of Baltimore, and Dr. Warfield T. Longcope and Dr. Rufus I. Cole, of New York, have been elected foreign associate members of the Swedish Medical Association.

Dr. Jules Bordet, director of the Pasteur Institute of Brussels, delivered the Herter lectures at the Johns Hopkins Hospital, Baltimore, on October 26th, 27th, and 28th.

Hospital for Shell Shocked Soldiers.—The new Government hospital at Perryville, Ind., where the United States Public Health Service will provide special care and treatment for shell shocked soldiers, was opened on September 24th, and over 100 patients were transferred from the temporary hospital at Cape May, N. J., to the new institution, where Surgeon E. H. Mullan is in charge. In addition to the main hospital building, there are numerous individual cottages where special care and a homelike environment can be provided where necessary. At the present time the Public Health Service has under treatment over twelve thousand discharged soldiers suffering from shell shock and other mental disorders. Of these 5,578 are in hospitals operated by the Service, and the remainder in other hospitals where proper care and treatment is provided under contract.

Public Health Service Takes Over Army Hospitals.—Two army hospitals, one in North Carolina and the other in New York Harbor, were taken over by the United States Public Health Service during the past week. The North Carolina hospital (O'Reilly Hospital), which is at Oteen, eight miles from Asheville, will be continued as a tuberculosis hospital with about one thousand beds; Dr. W. M. Foster will be in temporary charge.

The buildings were erected by the army for that particular purpose and are superior to most of those in base camps. Two of the wards will be remodeled, and some additional buildings will be erected for the use of the staff. The present patients will probably remain, if the hospital equipment can be taken over with them.

The hospital in New York, variously known as the Hoff General Hospital and the U. S. Debarkation Hospital, is at Fox Hills, Staten Island. It will be continued as a general hospital with a capacity of about five hundred beds. Dr. J. O. Cobb, recently in charge of Public Health Service activities at Chicago, will be in charge. By reason of its proximity to New York this hospital has available the best consultation facilities in the country.

Meetings of Local Societies.—The following medical societies will meet in New York during the coming week:

MONDAY, November 8th.—Society of Medical Jurisprudence; New York Ophthalmological Society; Yorkville Medical Society (annual); Williamsburg Medical Society, Brooklyn.

TUESDAY, November 9th.—New York Academy of Medicine (Section in Neurology and Psychiatry); Manhattan Dermatological Society; New York Obstetrical Society; Clinical Society of the Hospital for Deformities and Joint Diseases.

WEDNESDAY, November 10th.—Medical Society of the Borough of the Bronx; New York Pathological Society; New York Surgical Society; Alumni Association of the Norwegian Hospital, Brooklyn; Brooklyn Medical Association.

THURSDAY, November 11th.—New York Academy of Medicine (Section in Pediatrics); West End Clinical Society; Brooklyn Pathological Society.

FRIDAY, November 12th.—New York Academy of Medicine (Section in Otology); Eastern Medical Society of the City of New York; Flatbush Medical Society, Brooklyn; Society of Externs of the German Hospital in Brooklyn.

Died.

BROOKS.—In Auburn, Wash., on Thursday, October 21st, Dr. Frank Brooks, of Seattle, aged seventy years.

CAMPBELL.—In Cohoes, N. Y., on Wednesday, October 20th, Dr. William M. Campbell, aged fifty-nine years.

DROWNE.—In Roxbury, Mass., on Sunday, October 24th, Dr. Edwin Lewis Drowne, of Boston, aged forty-three years.

GARDNER.—In Philadelphia, Pa., on Tuesday, October 19th, Dr. Charles H. Gardner, aged eighty-two years.

GERHARD.—In Philadelphia, Pa., on Wednesday, October 27th, Dr. George S. Gerhard, aged seventy-one years.

HOYT.—In Concord, N. H., on Thursday, October 21st, Dr. Adrian H. Hoyt, aged fifty-nine years.

HORNING.—In Collegeville, Pa., on Wednesday, October 20th, Dr. Samuel B. Horning, aged fifty-eight years.

HUDSON.—In Yonkers, N. Y., on Saturday, October 30th, Dr. Walter Guy Hudson, aged fifty-one years.

KINNEY.—In Easton, Pa., on Tuesday, October 26th, Dr. Charles S. Kinney, aged sixty-six years.

LAMONT.—In Hazleton, Pa., on Saturday, October 23rd, Dr. Robert B. Lamont, aged seventy-two years.

McGINTY.—In Olyphant, Pa., on Friday, October 22nd, Dr. James McGinty, aged thirty-nine years.

MANN.—In Brockport, N. Y., on Saturday, October 23rd, Dr. William B. Mann, aged eighty-two years.

NEWMAN.—In New York, on Monday, October 26th, Dr. Charles F. Newman, of Brooklyn, N. Y., aged sixty-six years.

O'BRIEN.—In Orange, N. J., on Monday, October 18th, Dr. Daniel Jerome O'Brien, aged forty-five years.

RADIN.—In New York City, on Thursday, October 28th, Dr. Maurice L. Radin, aged forty-eight years.

RODGERS.—In Mifflintown, Pa., on Sunday, October 17th, Dr. W. H. Rodgers, aged seventy-five years.

STEPHENS.—In Mansfield, Tex., on Friday, October 15th, Dr. J. P. Stephens, aged seventy-one years.

THOMAS.—In Rochester, N. Y., on Thursday, October 21st, Dr. Cornelia White Thomas, aged fifty years.

THOMPSON.—In Cambridge, Ia., on Friday, October 22nd, Dr. Frank Thompson, aged sixty-two years.

WESTBROOK.—In Rock Island, Ia., on Wednesday, October 20th, Dr. Edwin Westbrook, aged sixty-three years.

WHITE.—In Sandwich, Mass., on Wednesday, October 20th, Dr. George E. White, aged seventy-one years.

Book Reviews

TREATMENT OF WOUNDS OF LUNG AND PLEURA.

The Treatment of Wounds of Lung and Pleura. Based on a Study of the Mechanics and Physiology of the Thorax. Artificial Pneumothorax Thoracentesis Treatment of Empyema. By Professor EUGENIO MORELLI, Assistant in the Medical Clinic of the Royal University of Pavia, Maggiore Medico, Field Hospital No. 79. Translated from the Italian by LINCOLN DAVIS, Formerly Lieutenant Colonel, M. C., U. S. Army, and FREDERICK C. IRVING, Formerly Major, M. C., U. S. Army. Illustrated. Boston: W. M. Leonard, 1920. Pp. xvi-214.

The work which Morelli did in connection with the treatment of wounds of the lung and the pleura places him among the men who devised ingenious measures for the treatment of the wounded in war. He takes his place with Gillies, of England, who gave us the pedicle tube, with Carrel, of France, who gave us a new method for the treatment of infected wounds, and Willems, of Belgium, who gave us the most radical method—one which seemed to be at variance with all we had been taught in regard to injuries involving articulations.

Much opposition was developed against Morelli, especially in regard to his doctrine of noninterference as far as foreign bodies were concerned. This was contrary to the teachings of the French school. In France great skill was shown by certain surgeons in the removal of foreign bodies by means of direct fluoroscopic examination and through a minute opening in the skin, an opening just large enough to admit a specially constructed forceps, the jaws of which were skillfully maneuvered to the point of contact with the foreign body and then opened to close again, this time grasping the body firmly and not releasing it until it was well outside the body of the patient. Great success attended the use of this method and the patients would be sitting up within a day or two and up and about within a week. Infection was seldom encountered. The only untoward results occurred when the region of the hilum was invaded. But let us get back to a discussion of Morelli's book. Of course he was enthusiastic about his methods and no doubt frequently used them when others would have served. For this reason his statistics are extremely good. In spite of all this, however, it seems as though the methods devised by Morelli, the perfection of his technic, and the many modifications which he so skillfully provided, should make the work which he did so enthusiastically during the war of far greater importance for the operation of pneumothorax in civil practice.

There will be many opportunities to test Morelli's methods under conditions identical with those he encountered during the war. For many of the injuries of peace simulate the more numerous injuries of war. And it would be well for the surgeons in civil practice to take advantage of the findings of men like Willems and Morelli and take them over into their work; apply them fearlessly and energetically to the cases they encounter. The great drawback is that there is felt a lack of familiarity with the technic and the older methods;

the methods they have become skillful in applying are frequently employed rather than an attempt made to adopt the newer and more radical procedures which have come into existence through the war. For just this reason it is to be urged that surgeons, or clinicians for that matter, in the case of Morelli's work, attempt to familiarize themselves with the details of his technic. This he has outlined with great care and elaboration in his section on treatment.

He gives many indications for the use of his method. Among the more important are: acute pleural eclampsia, interference with healing of the wound and difficulty of encystment of the projectile; acute hemorrhage; continuous oozing. By the production of a pneumothorax immobilization is obtained, compression of the lung is favored, and thereby both the healing of the wound and encystment of the projectile is hastened; through the pneumothorax the movement of the lung and suction ceases and hemorrhage can be prevented or checked; in case hemothorax existed it should be evacuated, and the danger is lessened if the blood is substituted by the air as it is removed and if done so as not to dilate the lung.

The principal opposition that Morelli has found to the treatment are summed up in the following assertions: The air put into the pleural cavity will escape either into the chest wall or lung; the air may be a source of infection; the establishment of a pneumothorax and the evacuation of a hemothorax with the substitution of air may cause embolism; and finally the hemothorax should not be evacuated because it serves for the compression of the lung and therefore checks the hemorrhage. These assertions are analyzed and each one carefully answered.

In this country where pneumothorax is a common procedure, questions of this kind would not be likely to occur. The question of the possibility of an embolus would seem to warrant the most serious consideration, but Morelli states that in over a thousand cases he has not caused a single embolus. This seems satisfactory enough but the question comes up if one less skillful could show a similar record. The last point of allowing the hemothorax to remain so that it may serve to check hemorrhage seems rather pointless as the presence of a quantity of material which would serve as an excellent culture medium is not a situation that should be defended. Morelli admits that there is danger in the removal of clots of blood when this is done carelessly or too rapidly, for hemorrhage may again be started; for this reason firm clotting should be allowed to take place and then the clot removed slowly and carefully. Then Morelli goes into the physiodynamics of having the blood used to cause compression of the lung. He shows that the effusion of blood is little fitted for this task.

Then we are taken into the details of the technic and this is worthy of most careful study. Many case histories are given, with numerous x ray photographs portraying the character of the work done.

DIFFICULT LABOR.

Herman's Difficult Labor. Sixth Edition, Revised and Enlarged by CARLTON OLDFIELD, M. D. (Lond.), F. R. C. S. (Eng.), Honorable Obstetric Surgeon to the General Infirmary, Leeds, etc. Illustrated. New York: William Wood & Co., 1920. Pp. ix-573.

Few changes have been made in Oldfield's revision of Herman's standard textbook, *Difficult Labor*. The principal change has occurred in regard to the advisability of the Cæsarean operation. The advice is given that the operation be a more frequent one in cases of contracted pelvis and in antepartum hemorrhage. The reasons for the advisability of this are fully explained. For a small and concise book of this character the illustrations are exceptionally good. They do credit to a textbook of much greater size and one covering the ground more extensively. Many revisions in technic are also noted. These, however, are not of a radical nature and not as extensive as some which have appeared recently in textbooks devoted to the surgical aspect of gynecology. From the mechanical point of view there is little to criticize, but it seems as though more attention might have been given to the chapters on infection and kidney diseases. Nevertheless the subject of labor, both normal and abnormal, is presented in a practical fashion.

ANALYSIS OF THE UNCONSCIOUS

Man's Unconscious Passion. By WILFRID LAY, Ph. D. New York: Dodd, Mead & Co., 1920.

An ancient preacher sighed, "Of the making of books there is no end." We have reason to suspect, however, from other of his words that he had lost enthusiasm for the active phases of life. There are two sufficient reasons for refusing to heed the weary preacher's complaint. Any new book can be accepted if it fulfills them. Is it the result of an effort to rise above the accepted level of thought and attainment? Does it introduce a new insight into old conditions which has all the stimulus of newly created thought? Or as the other suitable condition does the book fulfill a need of the writer's own, a healthful expression of his energized impulses. The latter can be really known only by the author himself, but at the same time such true outlet is possible only if the first condition also is met, if the work is creative. Then the effect upon the author is one shared with all his readers.

It is only fair to ask the author of this book, the third in a series of which he promises more to come, to consider whether he is entering deeply enough into the contemplation and investigation of the unconscious to give the public in each new book fresh stimulus. Lay has presented some of the cardinal facts which psychoanalysis has discovered in the unconscious in a manner to win the general reader's attention. He has presented these with special reference first to the actual existence of unconscious factors and the mechanisms by which these work. Second he has applied these facts to the problems of the child mind and its education.

In this present volume he definitely studies them in their relation to the mating of men and women, the necessity in marriage of union in both conscious and unconscious points of contact. He has pointed out the infant fixations upon the parent which present

such complete union. This brings the more complete view of the marriage relation to the attention of men and women who have thought little about the real reasons why marriages fail or who know little of the full basis of lasting union. He has also again included simple expression of fundamental psychological truths in an instructive manner with the force of everyday language and frequent apt illustration. Yet complaint must be made of confusion of thought and some uncertainty of expression. Most glaring is the introduction and attempted explanation of the division of the emotional life into affection and passion. We thought that for professed psychoanalysts at least Freud had reduced the consideration of this life to a simpler unified basis. To find Lay's restatement and his elaborated insistence upon it gives not only confusion but a sense of strained uncertainty of position on the writer's part.

DENTAL HYGIENE.

Hygiene, Dental and General. By CLAIR ELSMERE TURNER, Assistant Professor of Biology and Public Health in the Massachusetts Institute of Technology; Assistant Professor of Hygiene in the Tufts College Medical and Dental Schools. With Chapters on Dental Hygiene and Oral Prophylaxis, by WILLIAM RICE, Dean, Tufts College Dental School. Illustrated. St. Louis: C. V. Mosby Company, 1920. Pp. v-400.

Again we hear about dental hygiene from the New England States, the home of Fones and Forsythe, where no doubt more work is being done to stimulate the importance of hygiene of the mouth than anywhere else in the country. Dr. Turner, although he has written his book for the dentist, concerns himself most with a consideration of the general hygiene of both the functional and organic diseases of the individual and his relation to the community, touching carefully enough on the necessity for proper nutrition and the expenditure of sufficient energy through exercise or work. An important point is made in attributing disease or arrested development of parts of the body to a lack of proper functioning as much as to infective organisms. Dr. Rice, who has written the chapters on dental hygiene, gives the dentist a much needed warning when he says that "each tooth performs its function as a dependent unit in a perfect machine," for in truth the dentist still sees the tooth as an independent structure having no relation to what is really a most delicately constructed mechanism.

GERSTER'S AUTOBIOGRAPHY

Recollections of a New York Surgeon. By ARPAD G. GERSTER, M. D. Illustrated. New York: Paul B. Hoeber, 1917. Pp. xi-347.

It is often a matter of regret to a family that they did not pay more heed to and preserve the stories told them by the ancient grandparents who welcomed a listener to while the hours which were so long. Their experiences, touched by emotion, were infinitely more interesting than bundles of dusty letters often undated, or files of papers. Doctor Gerster's forbears evidently listened to and kept all records faithfully, so he greets us first from his own cradle in Hungary in 1848, then presents us to his Swiss ancestors back in 1378, returning

to Hungary and telling of the family circle and the political and social conditions which prevailed during his childhood, school days, and his being influenced by Robert Ultzmann, the urologist, to become a doctor. The scene changes to Vienna in 1864, and the youthful Gerster is listening to Hyrtyl in the University. Rakitansky, Skoda, Billroth figure in his student life, then followed army service and after that a determination to come to New York, a bold step for a youth. On the ship there was a certain Anna Wynne, returning to Cincinnati from musical studies in Stuttgart, who shortly after became the wife of this adventurous physician.

Owing to his letters of introduction, and, presumably, a certain amount of genius he is too modest to mention, he is well received, notably by a Doctor Krachowitz, who, better than his jaw-cracking name, takes much pains to launch young Gerster. The latter noticed at once something which struck English doctors and soldiers during the late war—the informality between doctor and patient, the absence of the Harley Street manner, and the greater cheeriness in the hospitals. He is delighted too with the clean, well lighted wards and operating rooms and the cordiality of the doctors, not being one of those who take all they can get in a foreign land and slang the givers. The German Hospital; Mount Sinai, the Polyclinic School knew him as a worker, the various medical societies and the Charaka Club know him as a member; some hundred medical and historical papers show him as a writer. Part three is a little account of his ways and habits, early inclinations, sports, and his joy in travels. There will be no need for his biographer to hunt for material; he himself has furnished enough, though in selecting, the biographer may unconsciously wound an inarticulate ghost by ignoring important points, but the man who really wants to know can always consult the *Recollections* as a volume which gives not merely one man's life but things of international interest in the medical world.

ROCKWELL'S RECOLLECTIONS.

Rambling Recollections. An Autobiography. By A. D. ROCKWELL, M.D. Illustrated. New York: Paul B. Hoeber, 1920. Pp. ix-332.

A pleasant book of men and things is this which Doctor Rockwell has prepared. He had designed it, he states, originally only for his family but has now given to a wider circle of readers these pleasant reminiscences. There are incidents of childhood in abundance, pleasant tales of healthy country life. The scenes in which they take place give a charming glimpse back into the simpler aspect of localities since greatly changed. There are reminiscences of old acquaintances of fellow physicians as well as of patients who have been well known in various walks of life. References also to members of other professions with whom his medical life has been associated, all these give many human points of interest. The narrative of the author's experience in the Civil War presents also much of this general anecdotal personal matter. There is but little even here, however, of his real surgical experience, as

there is very little throughout the book of the actual professional activity which he maintained.

Those of every age still in active service, no less than those at the very entering threshold look to one who has passed further for a number of vital things: They expect some revelation of the conflicts through which progress has been achieved. They expect a record of victories, of discoveries and achievements to give impetus to still undeveloped possibilities. They look for the stimulus of faithful endeavor which realizes that its only partial fulfilment is the opportunity to those following. Thus the aged worker flings out a stirring battlecry to those following. Pleasant as are these rambling recollections one listens in vain for this note. One cannot believe the author's long active life has failed to realize such an inspirational attitude for himself or others. He forgot, however, in writing that the younger generations are listening for its challenge. Or if they are not listening so much the more should they be startled by its utterance.

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

PRACTICAL VACCINE TREATMENT. For the General Practitioner. By R. W. ALLEN, M. A., M. D., B. S., Late Captain, N. Z. M. C. New York: Paul B. Hoeber, 1920. Pp. xii-308.

UNTERSUCHUNGEN UBER DIE MYELOMKRANKHEIT. Von Dr. ARVID WALLGREN Fruher 1:ster Assistent der Med. Klinik. Uppsala and Stockholm: Almqvist & Wiksellsboktryckeri-A.-B. 1 Distribution. Sid. 151.

COMMISSIONE PER LO STUDIO DELLE OPERE DI PICCOLA BONIFICA. Seconda Relazione della Lotta Antimalarica A Fiumicino (Roma) Diretta dal Prof. B. GRASSI. Roma: Tipografia del Senato di Giovanni Bardi, 1920. Pp. vii-314.

RETRAINING CANADA'S DISABLED SOLDIERS. By WALTER E. SEGSWORTH, M. E., Formerly Director of Vocational Training Department of Soldiers' Civil Reestablishment, Canada. Illustrated. Ottawa: J. de Labroquerie Taché, 1920. Pp. 193.

DIE PARTIGENGESETZE UND IHRE ALLGEMEINGULTIGKEIT. Erkenntnisse, Ergebnisse, Erstrebniisse, Allgemeinverstandlich dargestellt von HAND MUCH, Universitatsprofessor in Hamburg. Mit 2 Tafeln. Leipzig: Verlag von Curt Kabitzsch, 1921. Seiten 70.

TASCHENBUCH DER MAGEN- UND DARMKRANKHEITEN. Von Dr. WALTER WOLFF, dirig. Arzt der inneren Abteilung am Konigin - Elisabeth - Hospital, Berlin - Oberschoneweide. Zweite, vermehrte und verbesserte Auflage. Mit 18 Textabbildungen und einer farbigen Tafel. Berlin-Wien: Urban & Schwarzenberg, 1920. Seiten vii-199.

MATERNITAS. A Book Concerning the Care of the Prospective Mother and Her Child. By CHARLES E. PADDOCK, M. D., Professor of Obstetrics, Chicago Post-Graduate Medical School; Assistant Clinical Professor of Obstetrics, Rush Medical College; Attending Obstetrician, St. Luke's Hospital. Chicago: Cloyd J. Head & Co., 1920. Pp. 210.

THE LINK BETWEEN THE PRACTITIONER AND THE LABORATORY. A Guide to the Practitioner in His Relations with the Pathological Laboratory. By CAVENDISH FLETCHER, M. B., B. S. (Lond.), M. R. C. S., L. R. C. P., Director, Laboratories of Pathology and Public Health, London, and HUGH McLEAN, B. A., B. C. (Cantab.), D. P. H. (Camb.), M. R. C. S., L. R. C. P., Assistant Pathologist, Laboratories of Pathology and Public Health, London. New York: Paul B. Hoeber, 1920. Pp. 91.

Practical Therapeutics and Preventive Medicine

A Compendium of Treatment and Prophylaxis, Original and Adapted

X Ray in Fibromyomata of Uterus.—L. Martindale (*Archives of Radiology and Electrotherapy*, September, 1920) discusses the use of intensive x ray therapy versus hysterectomy in the treatment of fibromyomata of the uterus and presents the following conclusions:

As long as one's diagnosis necessarily remains faulty, there is a danger in using intensive x ray therapy for any but those cases in which we are fairly certain we are dealing with a straightforward uncomplicated case, e. g., a fibroid uterus well under the size of a six months pregnancy, interstitial rather than subperitoneal, and in which the chief and only symptom is excessive menorrhagia. In such a case it seems to me to be the treatment *par excellence*. Also in cases of grave heart disease, where no surgeon would like to operate, it is an ideal treatment, and the marked improvement in general health of such patients is wonderful. In all cases where diagnosis is doubtful, an exploratory laparotomy, followed by hysterectomy where necessary, is the only right treatment. It seems that x ray treatment may be looked upon as the treatment *de luxe* for all small uterine fibroid tumors associated with hemorrhage. It improves the health of the patient without interfering with her usual mode of life. It causes a great reduction in the size of the tumor, and therefore does away with pressure symptoms. It eliminates the nervous shock of an abdominal operation and the inconveniences of an anesthetic, and, as I said before, it brings about a climacteric involving less disturbances even than a natural one. Lastly, and most important of all, it is a treatment eminently successful in suitable cases—according to Gauss in ninety-nine per cent. of cases, and even according to my own series in ninety-seven and four tenths per cent. of the cases—and it is a treatment free from any mortality.

Maternal and Fetal Blood.—Stander and Tyler (*Surgery, Gynecology and Obstetrics*, September, 1920) give the following conclusions from their studies of the ash content in the fetal and maternal blood: 1. During pregnancy the water content of the blood is usually found to be between seventy-seven and eighty-two per cent., the accepted normal limits. The tendency is toward the upper extreme, and in one third of our cases this was slightly exceeded. 2. Examined month by month during pregnancy characteristic fluctuations in the blood moisture become apparent. It increases gradually until the seventh month and subsequently remains stationary or slowly decreases. At the onset of labor it is approximately the same as in the early weeks of gestation. The act of labor has no constant influence upon the blood moisture. 3. The water content of the blood and the corpuscular count vary inversely. 4. The plasma moisture, examined month by month, presents the same type of variation as that characteristic of the whole blood. 5. Quantitatively the blood ash and the plasma ash

are found to remain normal during pregnancy. 6. Eclampsia may not be distinguished from nephritis on the basis of blood moisture. In either complication, the percentage of water may be great enough to constitute a true hydremia, which is usually presented by cases with marked general edema. 7. identical values for the ash in maternal and fetal plasma indicate that a free exchange of their inorganic constituents takes place through the placenta in accord with the laws of osmosis. 8. The moisture of whole blood is appreciably higher in the mother than in the fetus. 9. The plasma moistures approach each other closely, though by the method employed a difference of one per cent. in favor of the fetus is found constantly. Some unrecognized factor, physical or chemical, maintains osmotic equilibrium between the two circulations, and water passes the placental partition equally well in either direction.

Aspiration and Pressure Treatment of Unopened Mammary Abscesses.—John P. Gardiner (*American Journal of Obstetrics*, November, 1919) states that the aspiration and pressure treatment is superior to the ordinary radial incision and drainage method in that drainage is better maintained, practically no scar remains, and the breast heals more quickly. In none of the eight cases he reports, did the treatment extend over nine days, from the first aspiration until no more pus from the cavity was obtained. The instruments used consist of two glass syringes, one an ordinary hypodermic syringe with a sharp needle of twenty-four gauge and the other a ten mil or larger syringe with a needle of seventeen gauge and at least two inches in length. The skin is first washed and painted with seven per cent. tincture of iodine. A 0.5 per cent. solution of novocaine, with three drops of adrenalin added to the ounce of solution, is then injected as an anesthetic at the site of election, down to and into the abscess cavity. The left hand now steadies the breast, and with the syringe in the right hand, the initial puncture is made with a quick stab into the skin. The solution is distributed equally along the proposed track for the aspirating needle. After a few minutes the latter is inserted, and the syringe filled and emptied repeatedly until the cavity is thoroughly evacuated. Upon frequently repeated aspirations plus constant pressure on the breast with a binder depends the success of the method. The second aspiration is performed four to six hours after the first, and the amount of fluid then obtained determines the frequency of the subsequent aspirations. Each succeeding needle puncture is made through the original one and is always preceded by local anesthesia. Abscesses contiguous to the original abscess are not difficult to locate because the pressure exerted by the bandage prevents any excessive edema, so that any induration between the skin of the breast and the chest wall is readily recognized by palpation. It is usually easy to drain by aspiration these con-

tigious abscesses through the original cavity. During the acute stages, before the abscess has localized, it is essential that the pressure bandage should not be removed from the breast except for the briefest possible time; the bandage should be continued for several days after a dry tap. Cold should be continuously applied unless pus is present, when heat is substituted. The author also has an autogenous vaccine made and administers a dose of five hundred millions on the fourth or fifth day after the first tap as a preventive against recurrent abscesses. Prenatal care of the nipples does not prevent the occurrence of sore nipples or breast abscesses. Care of the lactating breasts and nipples involves the following: Cleanliness; avoidance of prolonged and frequent nursings during the first days before the milk comes in; early recognition of a failing milk supply and the immediate institution of supplemental feedings, and temporary cessation of nursing on the first sign of local trouble, the lymphangitis being meanwhile combated by pressure and cold to the breast.

Generative Organs Treated by X Ray.—I. Seth Hirsch (*American Journal of Electrotherapeutics and Radiology*, August, 1920) presents the following findings from his use of the x ray in the gynecological field:

Advantages: 1. The treatment is painless. 2. It takes six to nine weeks, and if it fails the operation may be carried out under the same conditions as before. 3. If successful the menopause is not usually attended by any severe nervous symptoms. 4. The general systemic disturbances present after the operation are not present with this treatment. 5. There are no failures in the properly selected cases. 6. There is practically no mortality from this treatment, while the operative mortality varies from one to four per cent.

Disadvantages: 1. There is a definite time period before the cure is effected. 2. The fibroid may only partially disappear after several months, and in rare cases a recurrence may occur. 3. Malignant changes in fibroid tumors of the uterus may be present and overlooked, or malignant changes may take place in the fibroid under treatment. The last is the most important objection to the use of radiotherapy. It is true that a sarcoma may, except in the case of a rapidly growing tumor, be overlooked in determining the proper treatment. But sarcoma is very rare and occurs in less than a half of one per cent. of cases. Greater stress is laid on the coincidence of carcinoma or epithelioma with fibromyoma. It may occur in about five per cent. of the fibroids. Though it is obvious that an undiscovered cancer of the uterus will lead to fatal results, in spite of radiotherapy, it is also obvious that the discovery of cancer in the specimen after hysterectomy has been performed, presents the problem of surgical treatment in a new aspect.

Just as any form of treatment outlined for the fibroid is altered when the cancer is discovered, so the röntgen treatment must be altered if after the treatment is begun carcinoma is discovered. This phase of the case is in the hands of the gynecologist, whose constant scrutiny will minimize the possibility of an erroneous diagnosis.

Copper Sulphate in the Local Treatment of Inoperable Uterine Cancer and in Vaginal Recurrences.—D. Pamboukis and G. Berry (*Presse médicale*, May 22, 1920) remove any extensive fungous outgrowths by curettage, apply local pressure for a few moments to arrest bleeding, and then cover the surface with a powder consisting of one part of copper sulphate in twenty-five parts of powdered talc. To maintain contact of the powder as well as protect the surrounding vaginal mucosa a tampon or sterile compress is inserted. At subsequent dressings, the following paste is generally used: Copper sulphate (forty per cent.), one gram; magnesium oxide, ten grams; adrenalin solution, ten drops; glycerin, enough to make a pasty fluid. This preparation is painless and should be left in contact with the parts for one or two days. After its removal, an injection of one spoonful of sodium bicarbonate in two litres of warm water is administered. Internally, the following combination is simultaneously prescribed: Quinine bihydrochloride, 0.25 gram; magnesium oxide, 0.50 gram. Three such doses are taken in cachets each day. The local dressings are renewed at least three times a week at first, later less frequently, according to the extent of improvement of the lesions. Where there is a tendency to exuberant proliferation, copper sulphate crystals are applied directly, an attempt even being made to force them into the depths of the prominent vegetations while the rest of the vegetating surface is dusted with powdered copper sulphate crystals. Plenty of sterile petrolatum should be used on the tampon or compress, to protect the remainder of the vaginal mucosa. The pure salt should never be allowed to remain in contact longer than twenty-four hours, and should be alternated with the diluted powder or the paste.

Treatment of Menorrhagia with Radium.—S. W. Budd, (*Virginia Medical Monthly*, April, 1920), holds that in radium we have a remedy which in a large measure obviates the difficulties associated with successful termination of an intractable case of menorrhagia. Among the fifty cases of menorrhagia unassociated with cancer or fibroids, treated by the author with radium, some of the patients had to return for two or more radiations before they obtained relief, but in no instance did removal of the uterus become necessary. A simple dilatation and curettage is first done, the uterine cavity swabbed with iodine, and the radium then applied in a silver capsule, screened with one millimetre of brass. In short radiations the author does not screen with rubber, as do some other operators. The amount of radium to be used depends largely on the age of the patient and the condition under treatment. In young women under thirty-five years of age more than three hundred to four hundred milligram hours is seldom given in a single treatment. Application of twice this dose might bring about sudden termination of the menses. Three months are allowed to elapse and if the menstrual flow has not then returned to normal a second application is advised. The first period after radiation is often associated with menorrhagia, but the flow during the third period is usually not excessive, and at the third period a normal state is

reached. In women over thirty-five years of age a slightly larger dose is used, and more than one treatment is seldom required. Where there is no fibroid and the menorrhagia results from a hypertrophic endometritis or chronic metritis, five hundred to seven hundred milligram hours are usually given. In cases of menorrhagia with fibroids, the latter sometimes entirely disappear as a result of the treatment. After a radiation symptoms of intoxication such as nausea and slight fever may develop, but these subside within twenty-four hours. When the menorrhagia ceases the patient soon regains her hemoglobin and health.

Late Hereditary Syphilis.—Custex and Del Valle (*Surgery, Gynecology and Obstetrics*, August, 1920) state that:

1. Hereditary syphilis is a very frequent cause—perhaps the most frequent—of membranous perienteritis and analogous conditions.

2. Its pathogenesis is complex as several factors operate, which set down in chronological order are: defects of conformation in the intestinal walls because of the faulty endocrine function which presides over and governs their development. These malformations on the one hand, and the abnormal function of the nervous system (sympathetic and autonomous), owing to the endocrine deficiencies, produce defects in the gastrointestinal statics and dynamics. As a consequence of the latter we have intestinal stasis which brings on chronic inflammation of the colon. From the wall of the colon the inflammation spreads to the surrounding serous membrane, aggravating the existing congenital lesions. The primary cause of all this is hereditary syphilitic infection.

3. These patients, first of all, should be given mixed antisiphilitic treatment with mercury chiefly.

4. The surgical treatment is not to be abandoned, but is to be restricted to cases in which definite indications confirmed by clinical and radiological diagnoses point to mechanical alterations of importance (kinks, adhesions, etc.); or to coexisting inflammatory lesions of adjacent organs: ovaries, tubes, appendix, gallbladder, duodenum, and stomach. Surgical treatment should consist in separating membranes and in molding and mobilizing the peritoneum, together with careful peritonization and removal of the adjacent affected organs.

5. There is the group in which the patient suffers from the chronic abdomen and yet there is no anatomical lesion of importance. These should be considered as types of "sympathicopathy," owing to the particular deficiencies, more or less marked, of the endocrine glands as suprarenal capsules and thyroids, principally. It is important to know this type of chronic abdomen, for it involves a prognosis and a therapeutic management very different from the membranous perienteritic type.

6. The prognosis depends on the anatomical and clinical type, and the period or stage of the affection; good, in cases of early diagnosis and rational treatment; less favorable, in those of late diagnosis where rational treatment is impotent in modifying chronic lesions already well developed. In these a more or less pronounced improvement is to be obtained by carrying out suitable surgical treatment.

Amniotic Hernia.—Emanuel Friend (*Surgery, Gynecology and Obstetrics*, September, 1920) gives the following treatment for amniotic hernia: It is obvious that operation immediately after birth is imperative in order to save the child's life. Sanderson states that the time to operate is immediately after birth, before there is any drying out of the thin membrane covering the abdominal wall and before the hernial protrusion has been increased in size by accumulation of fluid in the stomach. The only cases which are amenable to treatment by operation are those which are small enough so that their contents can be reduced into the abdomen and a closure of the abdomen effected. When resection of liver or other abdominal contents is required the child usually dies. The Olshausen method has been effective in small protrusions of this type. The method consists in separation of the skin around the sac, removal of Wharton's jelly, and reduction of the hernia *en masse* without opening the sac and suture of the skin. Small protrusions can be treated by carefully cleansing the parts, keeping them as nearly aseptic as possible and applying pressure to the hernial tumor by means of adhesive plaster, and encircling the entire abdomen. Amniotic hernia is a rare condition. The treatment, when resection of abdominal organs is not indicated, is operative immediately after birth; for small protrusions or in case of failure to recognize the condition until late, the treatment is palliative.

Empirical Results of the Treatment of Cancerous Tumors with Radium.—S. A. Heyderdahl (*Acta Chirurgica Scandinavica*, June 12, 1920) gives a statistical summary of cases, 252 in all, treated by him during a period of five years in his capacity of senior physician to the Röntgen Radium Institute of the Riks Hospital, Christiania. While rodent ulcer and skin, mammary and uterine cancers comprised the majority, there were also cancers of the lip, cornea, mouth, maxillæ, neck, rectum, thyroid gland, axillary glands, bladder, penis, vagina, vulva, ovary, prostate, as well as leucoplasia oris. Of these eighty-eight were free from symptoms at the time of writing, eighty-one were improved, eighty-three not cured. Both tube and surface preparations were employed. In the former pure radium salts (radium-barium sulphate) were used, enclosed in platinum tubes with walls one-half mm. in thickness, this tube being enclosed in a case of silver one-tenth mm. thick. A description of his technic follows, including the use of Kerr's paste, which he considers an indispensable aid in radium therapeutics. The individual history and treatment of a large number of cases is given. The author points out the necessity of destroying the malignant tumor quickly by the aid of the largest possible doses of radium, as too small doses only irritate the more deeply situated parts to increased growth. Also prolonged treatment with small doses, he believes, weakens or renders impossible reaction from the surrounding tissue of the tumor, by causing degenerative changes in the blood vessels and lymphatic ducts, while the resorptive processes are more likely to be stimulated by acute irritation with radium rays.

Miscellany from Home and Foreign Journals

Functional Menstrual Disturbances.—Florence L. Meredith (*Surgery, Gynecology and Obstetrics*, October, 1920) states that mental hygiene and general hygiene, including general and special exercise, seem to be the treatment of choice in most cases of menstrual disturbances in young girls, and in many cases in older women. These disturbances are largely due to faulty muscular development and faulty circulation within the power of the individual to correct.

Physiology of Ovulation.—S. S. Schochet (*Surgery, Gynecology and Obstetrics*, August, 1920) gives the following as the results of his observations:

1. Ovulation is due to a specific enzyme, its nature being similar to the enzyme erepsin. Apparently there are other proteolytic enzymes in the liquor folliculi; also a lipase.
2. Atresia of the follicles is due to this proteolytic enzyme or enzymes.
3. That the experiments which were made offer a rational explanation for the use of thyroid extract and corpus luteum in sterility.

Relation of Pregnancy and Reproduction to Tumor Growth.—Maud Slye (*Journal of Cancer Research*, January, 1920) reports the results of five years' investigation of the behavior of tumor growth in its relation to pregnancy and reproduction. The experimental animals were mice bearing alveolar tubular carcinoma of the mammary gland. The conclusions arrived at are that reproducing females grow much less tumor than nonreproducing females of approximately the same age and general state of nutrition; reproducing females also grow much less tumor during the period of reproduction than when they are not pregnant. The various factors entering into the problem, such as the age of the mouse, and complicating causes of death, are given consideration.

Primary Spontaneous Tumors of the Ovary in Mice.—Maud Slye, Harriet F. Holmes, and H. Gideon Wells (*Journal of Cancer Research*, July, 1920) review the literature of ovarian tumors in animals, and state that among 22,000 mice of the Slye stock, dying natural deaths at all ages, forty-four mice had primary ovarian tumors, twenty-six having tumors in other parts of the body. Thirty-eight of the tumors were simple benign solid papillary adenomas, only occasionally with slight cyst formation. Nineteen, or fifty per cent. of these, were bilateral, so that there were fifty-seven tumors of this class. There was one typical papillary cystoma and one typical solid teratoma. Four unquestionably primary malignant tumors of the ovary, all showing the mesothelioma type of growth characteristic of malignant tumors derived from the sex glands were seen, one of which produced perirenal metastases. One other tumor of the same type was primary either in the ovary or the adrenal. Two round cell sarcomas arising either from the ovary or some other organ are described, and two other sarcomas had produced secondary growths in the ovary.

Icterus in Ectopic Gestation.—Edgar H. Norris (*Surgery, Gynecology and Obstetrics*, July, 1920) presents the following conclusions from a study of icterus in ectopic gestation: 1. Jaundice is a not uncommon symptom of ectopic gestation. 2. The presence of jaundice is of great importance and may frequently be the symptom which determines the differential diagnosis. 3. The jaundice in these cases is probably due entirely to the absorption of blood derived pigments produced by the hemolysis of the extravasated blood. 4. The blood serum often contains considerable quantities of blood pigment (hemoglobin, hematin, hemochromogen, hematoïdin). 5. In the progress of the differential diagnosis the blood serum should be studied both grossly and with the aid of the spectroscop.

Leucoplasia of the Bladder and Ureter.—Herman L. Kretschmer (*Surgery, Gynecology and Obstetrics*, October, 1920) presents the following conclusions from his extensive study of leucoplasia. 1. As far as a review of the present literature shows, the conclusion seems justified that leucoplasia is a rare condition. 2. The etiology is unknown. 3. The histopathological findings appear to be uniform and constant. 4. There is no symptom or symptom-complex by means of which the condition can be diagnosed. 5. The presence of large quantities of squamous epithelial cells in the urine from the bladder, or from the kidney after ureteral catheterization, and the passage of pieces of membrane or flakes of squamous epithelial cells, are very valuable findings in making the diagnosis. 6. By means of careful cystoscopic examination leucoplasia of the bladder can definitely be recognized.

Neonatal Mortality.—A. Newsholme (*Lancet*, May 22, 1920) discusses this subject, giving several charts representing the conditions in England and Wales. He states that a high infant mortality does not indicate that there is a selection of the fittest to survive, for it is shown that the communities with the high infant death rate have also a higher death rate in the later periods of life than communities with a low infant mortality, and concludes that the high early mortality rates point out some fundamental hygienic weakness of the locality. Moreover, he maintains that since there is a wide variation between the neonatal mortality rates of different communities there must be some removable cause in the places where the rate is high and that by discovering the cause we may appreciably reduce the deaths of newborn babes in the communities where the rate is now high. In a comprehensive survey of the possibility of improving the conditions he considers the following steps: 1. Continuous medical and nursing supervision during pregnancy, parturition, and infancy, perhaps through antenatal and postnatal clinics. 2. Skilled care during parturition. 3. Provision of maternity homes and hospitals. 4. Raised standards of the practice of midwifery. 5. Further research in antenatal pathology.

Heat and Infant Mortality.—Albert Jobin (*Canadian Medical Association Journal*, July, 1920) asserts that poor elimination of the body heat, food in excessive amount, and the depressing influence of a prolonged high atmospheric temperature, are three great reasons why infant mortality is so high during the summer. To eliminate these causes we must watch the temperature of the child's room and cut down the food to about two thirds of the ordinary allowance, making up any loss in fluids by giving water in sufficient amount. The child should also be lightly clothed and kept in the coolest and best ventilated room. During the heat of the day windows should be closed and opened during the night, in order to store as far as possible the cooler air of the night.

Toxicity of Mustard Gas to the Human Eye.—C. I. Reed, (*Journal of Pharmacology and Experimental Therapeutics*, March, 1920), reports investigations made to determine the minimum concentration of mustard gas that will produce effects on the unprotected eye of man. Thirteen subjects were exposed for periods varying according to the relative degree of skin sensitiveness in each individual, previously determined by a special method. Each man wore a respirator and nose clip to protect the respiratory tract, and one eye was protected as a control with one half of a close fitting rubber rimmed goggle. The experiments showed that the eyes are the structures of the body most sensitive to mustard gas. Concentrations of 0.0005 milligram of mustard gas to the litre of air—one part in ten millions—will produce visible eye reactions from less than one hour of exposure in individuals whose skin resistance is relatively high.

Acute Encephalitis in Children.—J. Comby (*Bulletins et memoires de la Société médicale des hôpitaux de Paris*, February 26, 1920) directs attention to the acute nonsuppurative variety of encephalitis in children, a condition already described and emphasized by him in 1906. The onset is sudden, sometimes with fever, vomiting, convulsions, and paralytic or comatose manifestations. The duration of the affection is variable. After a stage of restlessness or somnolence—lethargy, as it would now be termed—with or without ocular disturbances, secondary disorders, such as chorea, athetosis, paralysis, convulsions, insanity, idiocy, or epilepsy may follow. The prognosis is likewise variable. In the diagnosis, lumbar puncture, showing absence of lymphocytosis is important. The somnolence of lethargic encephalitis was absent in seventeen out of the twenty-five cases of acute encephalitis in children seen by the author since 1894. In six of the eight cases with somnolence, the condition followed influenza, and in one each, whooping cough and vaccination. The seventeen non-lethargic cases showed such etiological factors as influenza, one case; whooping cough, two cases; vaccination, one case; adenoiditis with otitis, one case; enteritis, six cases; carbon monoxide poisoning, one case, and unknown factors, five cases. In all these cases the provisional diagnosis had been tuberculous meningitis; from this they were soon distinguished by lumbar puncture and the course of the disease.

Tetany in the Adult, Due to Thyroid Apoplexy.—Cordier, (*Presse médicale*, April 3, 1920), reports the case of a man in colonial service in whom tetany of the upper extremities developed, with the usual clinical and electrical signs of this condition. Glandular therapy was followed by almost complete recovery, but the attacks then recurred, cachexia and acidosis set in, and the patient died in the midst of intense tetanoid spasms and violent prelaryngeal pain. At the autopsy a hematoma of the laryngopharyngeal region was found. Serial sections revealed destruction of one external parathyroid gland by the hematoma and the presence of large areas of hemorrhage in the other. The internal parathyroids could not be located. The tetany must undoubtedly be ascribed to the parathyroid injury. The case would seem to shed light on the cause of many cases of spontaneous tetany in adults. The acidosis was analogous to that noted by Morel in experimental parathyroidectomy, but whether it was actually the result of a parathyroid insufficiency is uncertain.

Fibrous Tumors of the Palm.—R. Ducastaing (*Paris médical*, March 20, 1920) states that the cause of fibrous tumors of the palm of the hand is as yet unknown. Care should be taken not to confound them with cysts, the result of traumatism and epidermal inclusion. Small fibromas, independent of any local irritative cause, often mark the first stage in retraction of the palmar fascia. The fibrous nodules develop insidiously. There is no manifest tuberculous family history, but a familial arthritic and rheumatic tendency is sometimes elicited. Pathological study of such a nodule revealed many new-formed vessels with endovascular inflammation; the centre of the tumor was infiltrated with numerous hemoglobin granulations. Clinically, the nodules cause little discomfort. There occur all transition stages between camptodactylia, palmar nodosities, and retraction of the fascia. In one of the author's cases the nodules did not seem to have any tendency to extend; in another, nodules and camptodactylia were simultaneously present, and in the third, the patient passed gradually through the various stages of fibrous infiltration, leading eventually to Dupuytren's contracture.

Common Origin of Chickenpox and of Some Cases of Herpes Zoster.—A. Netter (*Bulletin de l'Académie de médecine*, June 29, 1920) reports two instances in which a case of herpes zoster was manifestly secondary to one of chickenpox and itself manifestly gave rise to another case of the latter disease. In the first instance the child who had herpes zoster had been in a hospital for forty-three days, but had been transferred to a ward in which chickenpox had prevailed for nearly two months, just thirteen days before the herpes zoster came on. In the second instance a child contracted herpes zoster ten days after being transferred to a hospital from a boarding school in which chickenpox had been epidemic. Fifteen days later another child, who had been in this hospital seventy-nine days with lethargic encephalitis, contracted chickenpox. Feer recently reported a similar instance from a hospital in Zürich. Netter reviews other cases in the literature, illustrating a relationship of

chickenpox to some cases of herpes zoster, and concludes that in these cases of zoster the eruption arose through the localized action of the chickenpox virus upon the corresponding intervertebral ganglia. Sixteen cases of chickenpox closely following herpes zoster in the same person have been reported. The small number of persons contracting chickenpox from cases of herpes zoster is to be ascribed to the fact that a large proportion of individuals before exposure have already been immunized by a previous attack of chickenpox. The possibility should be borne in mind that a case of herpes zoster may be followed by the appearance of chickenpox in the same ward or family.

Action of Chloral on the Pupil.—Hyatt, McGuigan, and Rettig (*Journal of Pharmacology and Experimental Therapeutics*, July, 1920) point out that the pin point pupil in many cases of chloral poisoning may be responsible for the mistaking of chloral for morphine poisoning. One should remember that toxic doses of many drugs may give a pin point pupil, and that in the diagnosis other symptoms must be observed, the great difference between morphine and chloral poisoning being the condition of the reflexes. With chloral the reflexes and muscle tone are lost, while with morphine most of the reflexes are either normal or exaggerated. Small doses of chloral, such as one gram, produce in man a slightly contracted pupil resembling that of normal sleep. The authors' experiments show that large doses may produce a pin point pupil. No part of the mechanism of the eye peripheral to the ciliary ganglion is directly acted on by the chloral, and neither the ciliary nor the sympathetic ganglia are involved. The action is therefore central, and due to removal of inhibitory influences which normally are active. Strychnine, caffeine, atropine, and other centrally acting drugs are antagonistic to the action of chloral on the pupil.

Mechanism of Fever Reduction by Drugs.—H. G. Barbour and J. B. Herrmann (*Proceedings of the National Academy of Sciences*, March, 1920) note that dextrose taken by mouth has been found frequently to exert a mild antipyretic action. The experimental work of the authors showed that various antipyretic drugs—sodium salicylate, quinine hydrochloride, or antipyrine subcutaneously, or acetyl salicylic acid by mouth—increase the blood sugar in both normal and fevered dogs. In the latter this effect is accompanied by a dilution of the blood—indicated by diminished hemoglobin percentage—and a fall in temperature, neither of which occur in healthy animals. The authors' theory of the action of antipyretics is, therefore, that in fevered animals these drugs produce a dilution of the blood or plethora, hyperglycemia probably contributing largely to this effect. The plethora promotes dissipation of heat both by radiation—peripheral vasodilatation—and by water evaporation from the surface of the body. The occurrence of the plethora, with its resulting antipyretic effect, is apparently limited to fevered animals. This fact should probably be attributed not so much to a greater degree of hyperglycemia as to the relative water retention by the tissues which is said to accompany febrile conditions.

Major Trigeminal Neuralgias.—Harvey Cushing (*American Journal of the Medical Sciences*, August, 1920) describes five types of facial neuralgia capable of being mistaken for trigeminal neuralgia; those ascribed to the sphenopalatine ganglion, those secondary to zoster, those attributed to the geniculate ganglion, those accompanying certain cases of convulsive tic, and those due to an involvement of the trigeminus by tumors. Finally, an attempt is made to describe what are considered minor trigeminal neuralgias as distinguished from major trigeminal neuralgias, for which the Gasserian operation is the proper therapeutic procedure. Though the difference is merely one of degree, it is important to have some basis for separating them. In the case of the five types of pseudotrigeminal neuralgia which may be mistaken for trigeminal neuralgia, there is every reason to refrain, if possible, from a trigeminal neurectomy.

Functional Insufficiency of the Pulmonary Orifice in Association with Mitral Stenosis.—Vaquez and Magniel (*Bulletin de l'Académie de médecine*, March 9, 1920) report three cases presenting the usual manifestations of mitral stenosis together with a diastolic murmur with its maximum intensity on the left, along the sternal margin, and apparently originating in the second interspace. This murmur is believed to have been that already described by Graham Steel in 1886. Such a murmur may arise in one of two different ways. In one instance it is due to mechanical conditions and the rise of pressure in the lesser circulation, which results in distention of the pulmonary artery and its orifice. In other instances it is due to a pulmonary endarteritis, rather similar to the superadded, slowly progressive infectious endocarditis so frequently met with in valvular disease. Its localization in the pulmonary artery may be accounted for on the ground that this artery is particularly exposed to stress in these cases. The disturbance of the pulmonary artery entails additional danger chiefly through the infection associated with it; often it disappears when the infection is recovered from. Where it is due to mechanical distention of the vessel, the prognosis is much less serious, and it may even constitute a favorable factor, affording some degree of relief as regards the primary mitral disturbance.

Chemical Disinfection of Tuberculosis Sputum.—E. Arnould, (*Presse médicale*, April 3, 1920), recommends highly for this purpose a solution already used with success by Küss for several years. It consists of soft, potash soap, eight grams; crystalline sodium carbonate, ten grams; thirty-five per cent. formaldehyde solution, forty grams, and water, enough to make one litre. This soapy, alkaline solution, containing four per cent. of formaldehyde, liquefies the sputum thoroughly and certainly kills the tubercle bacilli in from fifteen to twenty hours. The solution is, moreover, odorless, gives off no irritating fumes, is of low toxicity, is easily handled, facilitates cleansing of sputum cups by its liquefying property, and can be prepared by any one at slight expense. The practitioner is urged to use this solution whenever circumstances do not permit of disinfection of sputum either by boiling water, steam, or incineration.

Proceedings of National and Local Societies

AMERICAN ASSOCIATION OF OBSTETRICIANS, GYNECOLOGISTS, AND ABDOMINAL SURGEONS.

Thirty-third Annual Meeting, Held at Atlantic City, N. J., September 20, 21, and 22, 1920.

The President, Dr. GEORGE W. CRILE, in the Chair.

Interesting Surgical Conditions of the Liver and Biliary Tract.—Dr. JOSEPH H. BRANHAM, of Baltimore, said that a healthy gallbladder should never be removed, nor should it be subjected to operation. When symptoms were severe enough to warrant operation, in most cases the organ was so diseased as to be of little or no value and was a menace to future health. For several years he had removed the gallbladder by a method that was almost subperitoneal. After the abdomen was opened the ducts and neighboring organs were carefully examined. This could usually be done by palpation. If the disease was confined to the gallbladder, an oval incision was made over the lower anterior surface of the organ, and the peritoneal coat was dissected from the deeper tissues. When the duct was reached it could always be known by the well marked sphincter. A considerable margin of the peritoneal coat was left at the liver attachment; the duct was severed, and after being explored and emptied of stones, a large catheter was fastened to it by a twenty day catgut suture; the peritoneal coat from each side was stitched together, and then to the ventral peritoneum. This left the catheter outside the peritoneal cavity and gave a smooth serous surface over the entire wound, thus preventing adhesions. By confining the incision to the accessible part of the organ, the suturing was made easier. A small cigarette drain left in for one or two days was all that was needed in most cases. After operations were done in this way, there were few adhesions, and the patients were left usually in good condition.

Dr. ORANGE G. PFAFF, of Indianapolis, Ind., in discussing the subject, said that all aimed to be conservative in the treatment of gallbladder diseases, but in the last few years the statement had been made that a gallbladder once diseased always diseased. This, however, was not always the case. If the abdomen was opened and no stones found, a gallbladder that could not easily be emptied by pressure should be drained, but in most instances, instead of draining the gallbladder that was grossly diseased, all were now agreed that the thing to do was to remove it.

Where the Rubber Glove Is Behind the Times.—Dr. ROBERT T. MORRIS, of New York, said that discarding the rubber glove represented one of the best advances of surgery in general. It interfered with the sense of touch in some kinds of work. In abdominal work the rubber glove was not necessary if the hands of the operator were otherwise well prepared. It made a longer incision necessary, and consequently was not in accordance with the principles of modern surgery.

Dr. HERMAN E. HAYD, of Buffalo, N. Y., said he thought that Dr. Morris had done the profession a great service in teaching them to do surgery through small incisions and to develop tactile sense. He was rather surprised that a man with a judicial mind like Dr. Morris's should have put before the association so strongly the results of the work of Kennedy without the use of rubber gloves. It was hard for him to believe that in ninety-nine per cent. of the cases in which other surgeons who wore gloves had operated there were adhesions, while those operators who did not wear gloves only had seven per cent. adhesions. To him this was ridiculous. Out of one hundred cases, probably sixty to seventy-five per cent. were the simplest kind of operations and would have taken but a short time to accomplish. He did not believe it was possible that such results could take place in the hands of ninety-nine men with adhesions and Dr. Kennedy had only seven per cent. adhesions from operating without gloves.

Dr. CHARLES L. BONIFIELD, of Cincinnati, Ohio, could not believe that the rubber glove in and of itself caused adhesions. He could conceive of a man with rubber gloves being rough, and a man without rubber gloves scratching tissues with his finger nails. One thing that induced him at an early age to wear rubber gloves was the fact that his finger nails were very hard to keep clean, and he seldom knew whether he had them clean or not, and he felt it was better to cover them up with something that he could boil. While rubber gloves might impair tactile sense a little, still they should be used in operating.

Dr. GORDON K. DICKINSON, of Jersey City, stated that Dr. Morris wanted to standardize surgery by discarding gloves. Why were gloves worn? To prevent infection. Why was infection likely? In one went the rounds of the clinics one would see the most incongruous things perpetrated, such as putting on soap and washing it off again. If one wanted to get his hands free from germs he must not wash the soap off and must not scrape it off. It did not do any good. Put soap on, rub it in, and one would kill the germs, and there was no germicide more potent than potassium soap.

Dr. JOHN W. KEEFE, of Providence, R. I., said that a surgeon's tactile sense was not as acute with a rubber glove on as it was without it. When rubber gloves first came into use he used them in nearly all cases in which he operated. Now and then he slipped the rubber gloves off because he thought he could feel better without them. At one time he was in the habit of going to see Dr. McBurney, who was one of the greatest surgeons America had ever produced. He told him about his difficulty, and he said that was exactly where the mistake was made. The rubber gloves should be kept on in a difficult case and the fingers ought to be educated as to how differently things felt with the gloves on. He went home and had practised that ever since.

Dr. JAMES N. WEST, of New York, said that Dr. Morris had spoken of the great tendency to standardization, with the result that it stifled originality. There were times when the surgeon could operate to greater advantage without the use of gloves than with them, particularly if he was very careful in the preparation of his hands.

Dr. ABRAHAM J. RONGY, of New York, said in a large city like New York it was not only unsafe to operate without gloves, but unsafe to examine patients in the office without gloves, and as a measure of protection the use of gloves was one of the best things for the physician.

Rupture of the Bladder during Labor.—Dr. JOHN W. POUCHER, of Poughkeepsie, N. Y., reported a case, stating that rupture of the bladder during labor was very rare. It might be caused by instrumentation or spontaneously by an overdistended bladder. The immediate symptoms simulated those of rupture of the uterus. It was important that the bladder be frequently emptied during severe and protracted labor. Recovery of the patient depended on prompt operative treatment.

My Method of Performing Version.—Dr. IRVING W. POTTER, of Buffalo, N. Y., stated that for the year ending August 31, 1920, he had personally delivered 1,113 women, 920 of whom were delivered by version. Of the 920 versions, 400 were in primiparæ, and 520 in multiparæ. He showed lantern slides demonstrating his method of performing podalic version. He emphasized the importance of proper preparation of the patient for delivery, the condition of the bladder, cervix, and vaginal canal. He laid stress on the position of the patient during delivery, and the degree of anesthesia necessary.

Dermoid Cysts of the Ovary; Etiology, Diagnosis, and Treatment.—Dr. BENJAMIN R. McCLELLAN, of Zenia, Ohio, gave a brief review of dermoid cyst of the ovary, saying that recent research into the etiology of these strange neoplasms, especially the work of Goodall, had added new interest and emphasis to the parthenogenetic theory. As to the diagnosis, the question of possible infection and malignant potentiality in these growths demanded more careful study of all tumors arising from the pelvic basin. The x ray should be more generally utilized. In the treatment the utmost care should be exercised in removing the tumor *en masse*, without the use of trocar or aspirator. The case reported by the author only added another example to prove the fact that these tumors did not prevent pregnancy nor interfere with parturition as long as the pedicle remained untwisted.

Certain Procedures in Vaginal Surgery.—Dr. SAMUEL W. BANDLER, of New York, described an operation for cystocele and prolapse of the uterus, modified by partial hysterectomy and complete perineorrhaphy. He exhibited numerous lantern slides and made a running comment on them.

Case of Congenital Absence of the Vagina with Other Abnormalities.—Dr. DAVID HADDEN, of Oakland, Cal., reported the case of a girl of eighteen with absence of menstruation. The symptoms were indefinite. Examination showed external parts nor-

mal with unperforated hymen. A body felt through the rectum occupied the position of the uterus. Operation revealed the absence of a vaginal canal, the pelvic mass being the right kidney fixed in position. The cecum and appendix were undescended and located in the right kidney fossa. A general consideration of the factors involved was discussed.

Luteum Extract.—Dr. ADAM P. LEIGHTON, JR., of Portland, Me., spoke of the necessity for combining thyroid extract with luteum in many cases. He spoke of the use of these extracts in cases of menorrhagia, dysmenorrhea, functional amenorrhea and obesity. The climacteric symptoms and others were due to ovarian insufficiency. He pointed out the great necessity for prolonged administration of luteum extract in order to obtain results.

Submucous Adenomyomata.—Dr. OTTO H. SCHWARZ, of St. Louis, Mo., stated that submucous adenomyomata were comparatively rare, only a few cases having been described in the literature. The condition was primarily a localized adenomyoma in the uterine wall. These tumors were usually diffuse in character and their tendency to become submucous was quite unusual. He described a very large submucous adenomyoma, unusual in structure, with marked cystic dilatation and intracanalicular projections. A subserous tumor, described by Robert Meyer, arising from the Wolffian duct or the parovarian tubules, was mentioned. The submucous tumor in the author's own case, although identical in structure with the tumor described by Meyer, was definitely of Müllerian origin.

Endocrine Influence, Mental and Physical, in Women.—Dr. JAMES E. KING, of Buffalo, N. Y., pointed out that the endocrine system supplied stimuli for the fulfillment of the two fundamental laws of nature. The secretions prompted in the human being many mental attributes. In women, both the physical and mental phenomena associated with reproduction were the result of glandular secretion. There was some fact and much theory bearing on this. Woman would be better understood when we had further knowledge of the complicated operation of her endocrine system.

Case Reports.—Dr. GEORGE VAN AMBER BROWN, of Detroit, Mich., reported, 1, papilloma of the bladder in a woman forty-five years of age; 2, a case of advanced carcinoma of the uterus in a woman of thirty-eight; 3, fibrosarcoma mucocellulare carcinomatodes (Krukenburg type of tumor) in a woman fifty-seven years of age; 4, chorioepithelioma malignum with multiple fibroid tumors in the uterine tissue, in a woman thirty-five years of age; 5, lymphoblastoma primary in the parovarium of a child five years of age.

Accidental Hemorrhage; Cæsarean Section; Hematuria in Pregnancy.—Dr. JAMES K. QUIGLEY, of Rochester, N. Y., reported two cases, one of accidental hemorrhage in which a Cæsarean section was done. The interesting points in this case were: 1. Of the several causes advanced as factors in the etiology of accidental hemorrhage, this patient presented three, viz.; trauma, a marked pregnancy toxemia, and a short umbilical cord (seventeen cm.) 2. Extreme intrauterine pressure. 3.

Gross appearance of the uterus *in situ*, corresponding to that described by Wing and by the author in a previous publication. 4. Relatively large amount of free peritoneal fluid. 5. Leucocytosis and clinical improvement following the two transfusions. The second case was one of hematuria in pregnancy in a primipara aged thirty. Of the various causes offered for hematuria, it seemed that the most plausible etiological factor was toxemia of pregnancy, as evidenced by increased blood pressure and edema.

Hernia of the Ileum Through a Rent in the Mesentery.—Dr. WILLIAM EDGAR DARNALL, of Atlantic City, N. J., reported the case of Mrs. D., aged forty-six, married, one child, weight two hundred pounds. She had never been seriously sick, family history was negative. She was well developed, with splendid physique, and the picture of health. She had had no symptoms until recently when she noticed a lump in the abdomen and had suffered from menorrhagia. Examination revealed a fibroid tumor of some size freely movable and uncomplicated and there was a very slight laceration of the cervix. On July 18, 1918, he performed a supravaginal hysterectomy, from which she made a perfect recovery and in due time was sent home.

On August 12th, a month afterward, she ate a large dinner, and the next morning, about six o'clock, she was seized with an agonizing pain in the epigastrium and vomited. The pain was so severe that morphine was administered. Her bowels were irrigated, producing a copious stool. The next day her pains were considerably improved but distention appeared. During the afternoon there was an absence of peristaltic sounds on auscultation, her pulse was increasing in rapidity and her temperature had risen to 101° F. Dr. Hobart A. Hare, of Philadelphia, saw her with Dr. Darnall in consultation and was of the opinion that in spite of the temperature there was some form of obstruction, although enemas still brought away some feces and gas. Operation was decided upon and performed at 5 p. m. The findings were as follows: Through an opening in the mesentery of the second convolution of the ileum there had slipped a loop of the ileum belonging to the first convolution high up on the left side under the spleen. There was a volvulus of this loop and it was gangrenous and perforated. There was an abscess in the left kidney pouch and foci of pus at various locations in the upper abdomen. The whole abdominal cavity was filled with fluid and intestinal contents.

The hernia was released and the rent in the mesentery closed. Twelve inches of ileum was resected and a Murphy button used for anastomosis. Drainage and counterdrainage were used. Proctoclysis with Locke-Ringer solution was instituted and the Fowler position ordered. An opportunity was afforded of inspecting the lower abdomen and pelvis which were found in perfect condition with no adhesions or constricting bands. He was unable to account for the rent in the mesentery so far away from the site of the pelvic operation, which made this unusual hernia possible. She had led a very quiet and well ordered life since her first operation and seemed in perfect health. The patient succumbed to shock in about five hours.

An Unusual Abdominal Cyst.—Dr. ORANGE G. PFAFF, of Indianapolis, Ind., on March 20, 1920, was consulted by a young married woman on account of a large abdominal cyst which had been tapped ten days previously, twelve quarts of thin fluid having been drawn off at that time, according to the statements of the patient and her husband. Her first menstruation occurred at the age of fourteen and this function had always been normal. She has passed through three normal pregnancies, the last one three years ago, which was followed by phlebitis affecting both legs. This had, however, practically disappeared when he first saw her. She had noticed some abdominal swelling about four months before she came to him. This had not given her much trouble until about six months before she consulted him, when she began to suffer severely from pressure. Her appetite was also impaired and she had lost a few pounds in weight in that time. The abdomen was greatly distended and fluctuation was readily elicited in every part. Dullness on percussion was general with the exception of a slight indistinct resonance at the epigastrium.

The case was considered one of large ovarian cyst, and on March 22d she came into the hospital and the following day was operated upon. Through the usual median incision Dr. Pfaff said that he came directly upon the sac, which was so densely adherent to the parietal peritoneum that it required some care to form a line of cleavage, the further separation, however, being accomplished with only moderate difficulty, and he was then able to pass his hand freely in every direction, widely on either side and almost from the diaphragm to the pelvic brim. Retracting the lower angle of the abdominal incision the bladder came into view and appeared to be normal and was free from adhesions. Its healthy color contrasted strongly with the dark, purplish red of the cyst wall, which was firmly adherent across the brim of the pelvis, in front of the uterus on a line corresponding to the vesicouterine fold. Upon separating the sac along this line a gush of several quarts of water occurred. He continued the separation and lifted up a flap of the material constituting the anterior wall of the cyst, which was now recognized as a perverted and greatly thickened omentum being in places more than half an inch thick. With the lower omental flap up he came upon a number of peritoneal cysts varying in size from that of a walnut to a large grapefruit which filled up the pelvis on both sides. The intestines were held down and away from the anterior abdomen wall by innumerable strands of adhesions, so that even when distended by gas there would be no note of tympany elicited on percussion. This was one of the puzzling elements in diagnosis. The laboratory report on the specimen removed for examination stated that the condition was one of proliferating tuberculosis with much newly formed fibrous tissues. Dr. Pfaff said that the case was unique in his experience. The great thickening of the omentum, the extensive fibrinous formation, and the restrained viscera were unusual and the resultant absence of tympany regardless of posture constituted a complex which was very puzzling indeed and very misleading in diagnosis.

Obstruction of the Superior Mesenteric Vessels from Bands, with Threatened Gangrene of the Greater Part of the Small Intestine; Recovery.—Dr. JAMES N. WEST, of New York, stated that gangrene of the small intestine, due to thrombosis of the superior mesenteric vessels, might have been cases of this kind. The distribution and anastomosis of the superior mesenteric vessels was such that, if they were destroyed, death must necessarily ensue. In a case reported by Dr. West, the patient, a female, aged twenty, had general abdominal pain for three days, when suddenly violent and uncontrollable pain developed, with elevation of temperature, increase of pulse rate, and moderate distention. Abdominal section revealed the small intestinal tract in a state approaching gangrene, with a firm band, which proved to be a cecal mesentery, extending across the superior mesenteric vessels. In the inflammatory process of the appendix the cecal mesentery undoubtedly became tightly constricted across the superior mesenteric vessels, obstructing them completely, and resulting in a swelling, edema, and bloody effusion in the mesentery of the small intestines. Appendectomy was performed, and the abdomen closed without drainage. Protracted recovery ensued. Union was by first intention. Collapse on the second and third days was successfully combated by intravenous saline infusions with adrenalin. On the fourth day there was a mild septic temperature, and on the sixth day there was diarrhea, continuing violently until the sixteenth day. Malpositions of the cecum were frequent, and might be hypodescent and hyperdescent. In hyperdescent volvulus of the cecum was favored and at times necessitated operation. The collapse, diarrhea, and septic temperature were probably due to autolysis.

The Toxic Thyroid; Its Treatment by Ether Oil Colonic Anesthesia.—Dr. GORDON K. DICKINSON, of Jersey City, N. J., said that mental stress required a strong thyroid, adrenal and liver. One or more might fail and produce symptoms. To handle such a case skillfully required a careful surgeon and an adept at applied psychology. Excessive action of thyroid was always associated with an overactivity of adrenal and glycogenic function of liver, and a mental state analogous to fright. Surgery of the thyroid under these conditions demanded recognition of component states. A slight affront to the mind overreacted on thyroid and adrenal. Proper technic demanded elimination of such possibility. An anesthesia cone to the face and a surgeon working at the neck were mental traumatism. In ether oil colonic anesthesia we had the ability to anesthetize patients safely without their knowledge.

Gehrung Pessary.—Dr. EDWARD J. ILL, of Newark, N. J., drew attention to the value of the Gehrung pessary. He urged its use in those who were old and decrepit, and for those with decompensated heart disease, diabetes, and serious renal disease; also for those with a pulmonary affection that contraindicated anesthesia and for timid patients. The use of the pessary, however, was by no means to take the place of the Watkins operation, of which Dr. Ill spoke in the highest terms.

Enuresis.—Dr. JOHN W. KEEFE, of Providence, R. I., said that, viewing the subject of enuresis broadly, he had arrived at the following conclusions: 1. Considering the multiplicity of measures that had been found to assist in the cure of enuresis, it seemed that underlying them all there must be some common factor, which he believed to be a psychophysiological impression made upon the brain. 2. Heredity undoubtedly played an important rôle. 3. These patients had a neurotic, unstable nervous system accompanied many times by mental retardation. 4. Psychotherapy, mental suggestion and education of the subconscious mind should supplement other forms of treatment to the end that involuntary or voluntary micturition might be anticipated. In a word his contention was that the cure was the result of the mental awakening and stabilizing of the brain cells that controlled the act of micturition.

The Female Pelvic Ureters.—Dr. DAVID W. TOVEY, of New York, said that palpation of the ureters should be a part of every vaginal examination. Ureteritis, because of the nerves irritated, might simulate disease of any of the abdominal organs. Palpation would make the diagnosis. There was nothing between the palpating fingers and the ureters but the anterior vaginal wall. They were marked on the anterior wall by the ureteral ridges and could be felt from their entrance into the bladder to the pelvic brim. They were felt as flattened cords the size of a leather shoe string, and could be displaced in the loose cellular tissue. In ureteritis, periureteritis, stone, pyelitis, and tuberculosis, the ureter was thickened and tender. Ureteritis and periureteritis were commonly due to infection from the cervix, and it might follow hysterectomy. It was a condition often mistaken for cystitis. Palpation showed a thickened tender ureter with intense desire to urinate. Treatment should be applied to the cervix and parametrium and not to the bladder, as cystoscopic examination showed the bladder to be normal.

Pathological Leucorrhea and Its Treatment.—Dr. FRANCIS REDER, of St. Louis, Mo., stated that all pathology had its basis in physiology. A leucorrhea which was physiological must be differentiated from one which was pathological. To gain an exact knowledge of the condition of the genital tract it was well to take an existing leucorrhea as a starting point. The character of the discharge and the various states upon which the discharge depended, might reveal the seat of the disorder. The term leucorrhea grouped together a large number of lesions, and although it was the most common and prominent symptom in the majority of uterovaginal cases, the fact that certain constitutional disorders had important relations with the different forms of leucorrhea must not be overlooked. Under such conditions it was not merely the expression of a symptom but of the disease itself. Different periods of female life presented different kinds of leucorrhea. Forms of leucorrhea which were not pathological were easy to diagnose and readily yielded to proper treatment. A pathological leucorrhea often presented great diagnostic difficulties.

(To be continued)

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THE PLACENTAL GLAND AND PLACENTAL EXTRACT.

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In the discussion of glandular interrelations, even though we leave out of consideration the possible element of altered character of the secretions, and concentrate our attention only on the thought of oversecretion or undersecretion, we have a markedly complex problem, owing to the numerous, in fact, almost innumerable variations which may exist. If to this already complex situation are added the variations in balance between the so-called vagus system on the one hand, and the sympathetic on the other, with their intimate and purposed association with the endocrine structures of the body, diagnosis and especially the reactions to endocrine therapy become still more uncertain. If we add further, what must not be omitted, the psychic factor in each individual patient, and the give and take dependence on physical states, on the autonomic nervous system and on the endocrines, we are led into a maze of problems sufficient to prove to the most unobserving that there can be few fixed and definite rules except such as serve to furnish an outline or a basis from which to proceed. Whether purposed or no, one may logically state that the outstanding sign posts of endocrine aberrations, such as acromegaly, Graves's disease, myxedema, Addison's disease, tetany, dystrophia, adiposogenitalis, diabetes, and other disturbances, were given to us to form or to help develop an outline or basis for the understanding of some of the vague factors in endocrinology. And even after years of observation and study, after years of surgery and clinical observation, after the close study of the changed metabolism, we are beginning to recognize more clearly the association of the thymus, the adrenals, the posterior pituitary, and the parathyroids with the numerous symptom complexes of the states known as Graves's disease and myxedema. Myxedema too is a pluriglandular disease, cretinism is a lack not only of thyroid but of other endocrines essential to physical, organic, and mental growth. While the administration of thyroid activates the other endocrines, some of them are not able to respond and these must be substituted by gland extracts themselves. And we also must, of neces-

sity, recognize the numerous deviations from the cardinal symptoms as expressed by what has been called vagotonia and sympathicotonia. And with all this, we have not yet solved the questions as they relate to the thyroid itself, for it is probable that the thyroid is related to both the vagus and the sympathetic systems and that in the thyroid we may have more than one hormone.

The fact that the thyroid affections tending towards the symptom complex myxedema and to the symptom complex Graves's disease, with their numerous degrees of intensity, are more frequent in women than in men, points to the sex organs and to the gonads as being the central point from which originate those differences in psyche, in the autonomic system and in the endocrines, which render the female more susceptible to the psychic, bacterial, functional or environmental causes responsible for these diseases. And if in searching more closely for the finer distinctions implied in so general a statement, a gynecologist centres his attention on the ovary, he must of necessity go back to physiology and the physiological processes as a starting point. The very fact that the major forms of thyroid abnormalities come into the sphere of observation after menstruation has been well established, and that the minor forms are extremely frequent at puberty and adolescence would furnish a suggestion of the relation of the menstrual endocrine interrelation to thyroid aberrations. That the menstrual life of women of itself proves endocrine interrelation to be less stable and settled than in the male, is self evident. Therefore endocrine instability or imbalance constitutes a predisposing factor. But this lack of stability involves other endocrines than the thyroid. It concerns the pituitary, the parathyroids, the mammæ, the adrenals, and other glands.

Pregnancy makes demands on these endocrine structures and the so-called male endocrine glands are brought into increased activity by substances thrown off by the ovum designed, of course, for this special purpose. The sequelæ of abortion, the asthenia postpartum, the psychic disturbances postpartum, are only factors which we take into consideration. Lactation, the responsibilities of motherhood, changed or altered sexual procedures add hugely to the accentuating predispositions. While all these numerous and diverse sustaining arguments may be brought into the field of discussion we must in the first instance go back to the normal

physiological process, in order to get a proper start, and therefore the relation of the endocrines to normal menstruation is brought to our attention.

The instinct of curiosity lies at the root of science and religion. Suggestibility is the quality which implies the acceptance of opinions without question. Contr suggestion signifies a tendency to accept the opposite of what is stated or implied. A judicious mixture of these elements in any individual is responsible for ordinary incredulity.

As I recall my earliest studies in medicine two points connected with gynecology stand out quite plainly. One was the hesitation, rather decided, to accept the then current theory that the ovum given out from the ovary entered into the fallopian tube when the outer end of the latter partially enveloped the ovary before the rupture of the graafian follicle. It was difficult for many of us to understand how, in a case in which the ovary of one side had been removed and the tube of the other side had been removed, the fimbriated end of the fallopian tube could make this extensive excursion to the other ovary, this apart from the marvellous mechanism implied in the timing of such a process. It was not long before the knowledge of the action of the ciliated epithelium of the fallopian tubes made clear the manner in which ova enter the uterus. The other point which constituted a puzzle, was the amenorrhea of pregnancy; in other words, why does menstruation cease when fecundation takes place? Some years later the work of Von Spee and others on extremely early nested fecundated ova showed that the ovum buried itself in the decidua and that a digestive action is exerted by the trophoblast upon the surrounding decidual cells and capillaries of the now decidua of pregnancy. The question was, then, why does menstruation cease when embedding takes place? Implantations of thyroid gland furnished not only the physiological but the therapeutic tests of the existence of its internal action. Thyroid extract, in myxedema, gave the final touch that was needed in the demonstration of the hormone action going on in the body.

It was Knauer who, by his transplants of ovaries in animals, clearly demonstrated that the ovaries, too, produced their effects by means of an internal secretion, and not by any mechanically stimulated reflex acting through the autonomic nervous system. Then came the wonderful observations of the pathologists, who showed that in the various months of pregnancy, syncytial cells and chorionic epithelia were being continually thrown off into the circulation, dissolved and absorbed. This made easy the interpretation of these processes as a secretory function; in other words, it showed that we were dealing with what was truly a secretion produced by the outer shell of the ovum—that is, the placental secretion, for the placenta is only an exaggerated development of the chorion. In those days, when the ovary was considered the sole factor in the premenstrual and menstrual functions, a step forward was taken in the demonstration by these syncytial processes of what was later recognized as the antagonistic or inhibitory action of one secretory structure upon another in the performance of a normal physiological process.

While later the ovary and thyroid were recognized as of almost equal significance to the female sex organs, supporting each other in certain phases and probably antagonistic in others, yet at this time no direct proof of any relation or balance between ovary and thyroid was clearly disclosed. It did seem clear, however, that the ovary in its turn possessed the power of influencing thyroid activity and, therapeutically, ovarian extract was used in hyperthyroidism. The thyroid develops at puberty and adolescence, it swells before each menstrual flow, it develops noticeably in the early months of pregnancy, and numerous experiments on the thyroid and the results of its failing or diminished functions during the years of development, prove it to be intimately related, not only to growth and to mental development, but quite specifically related to the early and later development of sex organs. In other words, the thyroid activates the other endocrines and exerts a trophic effect on tissues and cells. As regards the ovaries and the progressive change of the corpus luteum of menstruation into the true yellow body of pregnancy, nothing then but the external envelope of the nidated ovum, its trophoblast, syncytium, and chorionic epithelium could be held responsible. The reaction and stimulation of the corpus luteum by the tiny ovum, and by the offthrow from the cells invading the maternal capillaries, is an evidence of unity of action designed to accomplish a definite purpose.

As a broader understanding of endocrine action on menstrual function became more clear, it was apparent that while the ovaries initiated menstruation, the corpus luteum aided in changing the endometrium into the decidua menstrualis and, by limiting the tendency to rhexis and diapedesis was concerned in perpetuating the decidua menstrualis into the decidua of pregnancy. But other of the internal structures are also concerned in this function whereby the nesting of the ovum is favored. This relation of the thyroid was not recognized early but its action on the decidua, trophic in character, was later readily granted. One effect is to prevent any myxedematous change in the decidual cells and structure and to limit bleeding. Thyroid activity, we believe, first exerts a trophic effect on the decidua, and second, aids in the nidation of the ovum.

Later came the understanding that the adrenals, and particularly the pituitary body, were involved in the cyclic process, called menstruation. If this were so, then activity by what might be called placental secretion was limited, not to the ovary alone, but concerned other glands. Since its relation to the corpus luteum is of a stimulative nature, the corpus luteum and placenta have then a somewhat similar function.

The study of the action of the pituitary gland, and its relation to uterine processes during menstruation, the not infrequent occurrence of dysmenorrhea, the realization that menstruation was a miniature labor, turned our thoughts more directly to the study of the relations of the posterior pituitary to menstruation and to the interrelation between the various endocrines on the one hand, and the posterior pituitary on the other. Since the

thyroid is stimulated before and during menstruation, the natural thought is that corpus luteum rouses part of the thyroid and stimulates the posterior pituitary. Since overactivity of the posterior pituitary is a stimulus to the onset of menstruation, the suggestion becomes more relevant, that the placental secretion inhibits the posterior pituitary. Such a notion would make the placenta and another part of the thyroid and corpus luteum partners, so to speak, in their antagonism to one and the same endocrine.

The production of menstruation is initiated by the ovary, not forgetting the interstitial structure. Cooperation is evidenced by the corpus luteum and thyroid and the posterior pituitary. Unless the posterior pituitary is inhibited, menstruation takes place. I may say that the effect of the posterior pituitary in aiding the onset of menstruation is evidenced by its therapeutic application. It would seem as if all these endocrine activities suggested and started in each premenstrual phase are then accentuated and made into a definite balance for nine months, by the introduction of the placenta. The balance in the autonomic nervous system which takes on the form of a crisis at menstruation is altered by placental action and is postponed to the day of labor. In pregnancy the entrance of the anterior pituitary and particularly of the adrenal cortex is assumed as produced by the placenta.

That the ovary contains elements differing in their degree of influence and even in the character of their influence seems to be fairly well established. While extract of the hilum and ovarin diminish uterine contraction and lengthen the coagulation time, corpus luteum contracts the uterus and shortens coagulation time. While all the elements further uterine hyperemia, the corpus luteum does so less markedly. While the interstitial tissue and the corpus luteum favor dilatation of the peripheral vessels, the follicle tissue and the liquor folliculi do not dilate the peripheral vessels and do not postpone the coagulation of blood, ovarin and lutein and placenta are trophic in their action on the uterus and favor its growth and hypertrophy. But they, too, appear dependent on an associated activity of the thyroid so that their normal functions may be carried out. Even though the contractile function of the posterior pituitary is normally nullified during pregnancy, its trophic effect is still exerted and through a normal relation and cooperation of these glands, assisted by the stimulated activity of the anterior pituitary, and the suprarenal cortex, we have a growth of the uterus, especially in the early months, which can by no means be attributed to any mechanical stretching action by the ovum. It seems as if the placenta which, of course, is partly male in origin, brings into the sphere of activity what might be called the male glands, meaning thereby, the anterior pituitary and the adrenal cortex which functionate in a relative degree, more in the male than they do in the female. Menstruation is not a process which Nature wishes. Instead of thinking of menstruation as the normal picture and pregnancy as a new process, let us think of the matter in the reverse manner. Let us view menstruation as a process to which Nature yields un-

readily, hoping each month to see use made of the preparatory steps and readjustments taking place in the uterus and in the endocrine system. If a nest for the awaited impregnated ovum is prepared, if nidation is favored by certain endocrines, if other endocrines which favor menstruation are to be checked, then the fecundated ovum must bring its own material for the preservation of the balance essential to continued growth. The inability to preserve this balance, the inability to hold the interstitial ovary, the posterior pituitary, and probably the adrenal medulla in check, accounts very readily then for many cases of so-called sterility and for many cases of repeated miscarriage.

Before going further, let us review the premenstrual constitutional phenomena. We speak of premenstrual cyclic changes, but they are, as stated above, changes which anticipate nidation, and menstruation is simply to be viewed as an evidence that nidation has not taken place. Stated in simple language, ovary and thyroid, pituitary and adrenals and probably other endocrines increase their functions. A balance exists in the endocrines and in each endocrine awaiting nidation. Nidation introduces a new secretion and one end of the balance becomes stronger and the crisis known as menstruation is postponed for ten lunar months, when the postponed crisis does occur in a magnified form, known as labor. Therefore premenstrual phenomena of a constitutional nature and their variations depend greatly on the interglandular relations of that period and may concern interstitial, ovary, corpus luteum, thyroid, adrenal cortex, adrenal medulla, anterior pituitary, posterior pituitary, and other glands.

Of the various endocrines, little is generally known or established concerning the pineal, the adrenal cortex, and concerning posterior pituitary overactivity. It was the study of this latter condition, and the belief in its frequent occurrence and its probable relation to many premenstrual annoyances, and possibly to many psychic disturbances, that attracted me to the study of the effects of placental extract administered by mouth and by hypodermic injection. My belief is that in the premenstrual rearrangement of the endocrine relations, the thyroid, adrenal, medulla, and the posterior pituitary are responsible for the largest number of annoying symptoms. Placental extract is therefore used with judgment in selected cases, for the very fact that it delays menstruation constitutes a bar to its use in cases of relative amenorrhea with or without dysmenorrhea unless given in combination with ovarian extract.

When pregnancy takes place, the placental extract aids by throwing its weight into the balance against part of the thyroid, posterior pituitary, and adrenal medulla. For months the constitutional annoyances, which so often occur before menstruation, disappear and even though the nausea and vomiting of pregnancy may be severe, these are of a different nature. The soothing effect, the quieting effect, the stimulating effect in the vast majority of cases of pregnancy should of itself make a silent plea for the powerful influence of the placental secretion and its allies, the anterior pituitary and the adrenal

cortex, and if by reason of an unusual power in the glands to be inhibited, this soothing effect is not in evidence, we may point to some of the annoyances, especially in the later months, as an evidence of endocrine rebellion and dysbalance and to other annoyances, as probably related to anaphylaxis.

If cyclic premenstrual constitutional phenomena are an index to the endocrine relations of the moment, then the premenstrual psychic phenomena may be judged by the same token. And in the study of the premenstrual psychic upsets, we get a glimpse of the various mental aberrations dignified, when sufficiently gross by the term psychosis. And it is from a study of the question from this angle, as it were, that the view is fixed in my mind, that, whatever may be the exciting and contributing causes, abnormal and altered endocrine action should be given an important place in discussing and treating the so-called mental diseases. The annoyances of pregnancy are physical and rarely psychic. But in the postpartum period, we do observe the onset of melancholia, mania, or other manifestations. These two facts are mentioned again as proof of the quieting psychic action of the placental element and of the disturbed relationship (which sometimes occurs) in the attempt at endocrine rearrangement after the termination of pregnancy. And since we are still discussing pregnancy we may step back a distance and call attention to the fact that while sterility, in some cases, is due to a lack of proper function on the part of the ovary or the thyroid, or the pituitary, yet, excessive action of the posterior pituitary is a very frequent cause of sterility, of extremely early miscarriage, often not recognized as such, of miscarriage at periods when it is readily recognized, and of repeated or habitual miscarriage.

A notable action of placental extract is the production of what the patient calls "a sleepy, dopey feeling," and this is often noted, even though thyroid extract and placenta are administered together. Only rarely is a result observed in regard to the pulse rate. A few patients have complained of paroxysmal tachycardia even though thyroid was not given. Therefore there occasionally take place either a thyroid or an adrenal stimulation, but this influence is only transitory, for I have given placental extract in hyperthyroid cases without production of tachycardia, or an increase in tachycardia, and not rarely with great benefit.

The therapeutic test is supplied by the results obtained on the administration of placental extract. What is its effect on menstruation? As a rule the normal rhythmical menstruation function is delayed thereby several days. This action is likewise evidenced in many individuals whose menstruation, while regular, comes on at periods three to five days before the normal interval is reached. Going further into the field of pathology and considering cases of menorrhagia or even metrorrhagia, it is found that placental extract tends to diminish bleeding. Therefore, judging by my own experience, I take it that placental extract not only inhibits those regular processes whereby blood is lost from the uterus, but does likewise in many conditions

simulating menstruation, even though the flow is profuse or the interval shorter than normal.

Placental extract has an effect second only to mammary extract, in diminishing excessive menstruation, though it lacks entirely the power often evidenced by mammary extract, of diminishing the size of the uterus as in myomata, and it does not have a like influence in aiding involution. Carrying the therapeutic effort over into the field of pregnancy, I find that threatened early miscarriage or abortion is often averted by the administration of placental extract and thyroid extract. The various processes going on in the uterus, which are typical of normal menstruation, are practically the steps which occur in many miscarriages. Therefore placental extract, by inhibiting these processes, furnishes added proof that it delays or inhibits the processes tending to menstruation. During pregnancy many patients are sleepy, drowsy and tired, without a suggestion of nausea, and we presuppose here that the placenta has put the posterior pituitary to sleep.

The premenstrual rousing action which the corpus luteum exerts upon the thyroid and the important relation between the corpus luteum and the thyroid during pregnancy emphasize the place of these two glands in the scheme of endocrines as sensitized allies in a process that concerns opposition to the posterior pituitary. This sensitization, designed for aid to the processes of procreation, is one of the factors which makes thyroid aberrations so frequent in women. It is this uncertain balance between thyroid and corpus luteum and posterior pituitary which tends to make pituitary aberrations so frequent in women.

The effect of placental extract in frequently relieving the psychic symptoms of restlessness, marked irritability and physical and mental *wanderlust*, which I attribute, in many cases at least, to overactivity of the posterior pituitary, has led me to think that deviations in the activity of the posterior pituitary may be responsible, not only for alterations in the amount and character of the cerebrospinal fluid, but for changes in certain cerebrospinal areas which cannot, as yet, be defined, and for changes in the autonomic nervous system, and consequently for changes in behavior.

Judging from the quieting effects of placental extract in those cases where the symptoms are seemingly due to posterior pituitary overactivity, I translated my observations to the realm of that phase of human instinct called the libido sexualis. If we take the libido into consideration, we must grant the relation of the endocrines to this element in the human being. In the female, the pituitary plays an extremely important part not only so far as concerns the physical but likewise as regards the psychic association. I consider this condition to be an urge with an endocrine basis, and for that reason its variations in intensity are numerous and the variations at different periods of life are often noteworthy. Placental extract is, so far as I know, the most valuable of the endocrines administered for the purpose of controlling or modifying this human instinct. Though Freud would have us believe that the neuroses and psychoses are related

almost entirely to the instinct of sex, it requires little experience and little study to prove that this is certainly not the case. But many of the endocrines are related to growth and to the preservation of function, and most of the important ones are naturally related in part to the development and preservation of the organs of sex and of the instincts and emotions associated therewith. Hence among the neuroses and psychoses there must of necessity arise symptoms and phenomena, often overexaggerated as to their importance, which bear an intimate relation to the physical or psychic processes associated with the sex side of man. In many of these aberrations the balance in the glands and between glands which stimulate and those which inhibit is lost, most often through a physical endocrine predominance and not as a matter of will or even desire. I find the thymus and the placental extracts valuable when our purpose is that of anesthetizing or modifying the so-called libido sexualis.

Many factors of an apparently unrelated nature may influence cerebrospinal pressure. Thus the injection of duodenal mucosa extract exercises an effect on the cerebrospinal fluid. Hypertonic and hypotonic solutions injected into the veins or introduced into the gastrointestinal tract or into the rectum lower and raise the cerebrospinal pressure (Weed and McKibbin). The therapeutic effect of spinal puncture in some cases of eclampsia is remarkable, and so in many severe as well as in mild conditions this factor must be taken into consideration. For this reason, but without the support of results furnished by animal experimentation, I have used placental extract when headaches, stiffness of the neck, and other disorders, seem by their location to be possibly connected with variations in pressure or possibly qualitative complications in the cerebrospinal fluid.

It is stated that the normal escape from the cerebral chamber is by way of the arachnoid villi direct into the dural sinuses, and along perineural spaces about the cranial and spinal nerves. The cell membrane of Gley is believed to be concerned by osmosis with the amount and character of the cerebrospinal fluid. Dr. A. Goodman is more than ever convinced by his more extensive work of the beneficial effect in chorea of injecting the serum of the patient to take the place of the withdrawn cerebrospinal fluid. It was for these reasons that I have noted the action of placental extract by mouth and by hypodermic injection because it seemed possible that it might be influential in promoting osmosis or exchange. I have to this day no proofs that it in any way alters pressure within the cerebrospinal canal, either raising or lowering it. But the very gratifying relief of many of the typical headaches makes me lean to the notion that it probably diminishes pressure.

The study of gland modifications in pregnancy divulges the thyroid as an all important structure designed for the protection of the pregnant woman and for the preservation of a normal state. The pituitary, however, by its interference with this normal balance, is of the greatest importance in the production of pathological conditions. Many con-

siderations have entered into the study and observation of these phenomena and I have come to the conclusion that in thyroid minus and posterior pituitary plus we have a very frequent combination, associated in many cases with the toxemia of pregnancy in its various well known manifestations. Not the least noteworthy is the increase in blood pressure, the headaches, and the excess of the cerebrospinal fluid. In this latter condition the cell membrane of Gley is apparently involved and by reason of its very location and its relation to the cerebrospinal fluid this posterior pituitary gland may well be related to the processes of osmosis and exchange. That this should be the case in a secretory structure like the cell membrane of Gley is a natural deduction, since we know the relation of the posterior pituitary to renal function and to renal excretion.

The great and complex metabolic changes of the body in its normal state yield to important metabolic alterations in the pregnant individual, and without attempting to solve or even explain the intricate processes which have yet to be discovered, we are therapeutically depending more and more on our conception of endocrine aberrations to aid in the solution; and as the thyroid gland is, to my mind, one of the important protecting organs, especially over the renal epithelium, it is only necessary to conceive of a myxedematous change in the renal epithelium and in altered kidney function produced by the posterior pituitary, to furnish ourselves with at least an outline of some of the changes occurring in the so-called pregnancy kidney. A like change in the cell membrane of Gley would serve to explain many of the cerebrospinal symptoms in the pre-eclamptic and eclamptic states. It was a study of this condition that attracted my attention to that form of headaches so peculiarly typical in women, the headaches in the occipital region radiating behind the ear and down the cervical spine, associated with soreness and stiffness. I set out with the idea that these changes—which are so often premenstrual, but not always—may be due to altered activity of the posterior pituitary (though possibly in part to a swelling or hyperemia of this structure), but more probably due to some interference with osmosis, the cell membrane of Gley, and the spinal nerve roots.

While some were helped by thyroid and some by corpus luteum, I have found that in a number of cases placental extract gives surprisingly effectual results; and when with peculiar headaches of this type we find not infrequently psychic disturbance characterized by restlessness and inability to be physically or mentally quiet—a typical mental *wanderlust*, as we might call it—it is the first thought to attribute both to the same cause, and if this be true, what stretch of the imagination is it to conclude that mental *wanderlust*, without these typical headaches, may be due to the same cause? Only by dissociating associated phenomena can we lay the finger of investigation on many of our puzzling problems. Furthermore, when by the therapeutic application of placental extract the physical manifestations disappear and the psychic peculiarities often improve noticeably, the test of

therapy justifies the conclusion that the primary conception was correct.

Since in many of these cases the blood pressure was above normal, a test was made concerning high blood pressure in general, and it became apparent that a number of the endocrines enter into the causation of high blood pressure in many cases, and metabolic changes occurring in the body serve as an explanation for the apparently contradictory basic theories. Hence it is apparent to me that there are no one, two, or three endocrine causes of high blood pressure, but that each individual with this symptom must be viewed as a distinct entity and the gland aberrations of that individual must be sought for and disclosed, of course first taking physical states into consideration.

Pursuing this plan from the basis of menstruation alone, and treating the conditions of amenorrhea, menorrhagia, metrorrhagia, and dysmenorrhea by endocrines, not infrequently I noticed a reduction of the blood pressure, even though no attempt at a solution of the primary cause was in mind at the time; and taking a large number of patients at the climacteric period and noting their symptoms after this basic experience, the fact was likewise disclosed that in many cases the blood pressure was noticeably reduced.

Considering this material, the fact stands out that thyroid minus and pituitary plus explain a certain proportion of cases of high blood pressure. When this is traced back to the domain of physiology, it suggests the influence which the thyroid and the pituitary probably have on the cerebrospinal fluid, and on the kidneys and their excretory function; but to state that a pituitary minus may not be associated with high cerebrospinal fluid pressure is to disregard entirely the metabolic changes associated with endocrine activities and to overlook the relation of either plus or minus pituitary to the osmosis and interchange in the cerebrospinal fluid. For while diabetes insipidus is attributed to pituitary minus, I am inclined to believe that in some cases pituitary plus increases the urinary output. So, reviewing the theoretical, the physiological and the therapeutic conditions, I have become satisfied that we have in placental extract a substance which should be ranked among our therapeutic agencies as worthy of study. If posterior pituitary does half the harm for which, in my opinion, its overactivity is responsible; if placental extract does only half as much as I have gleaned from my therapeutic endeavors, I may still safely suggest that the important factor concerning placental extract is its ability to influence the posterior pituitary and to stimulate the anterior pituitary and the adrenal cortex.

134 WEST EIGHTY-SEVENTH STREET.

Rhabdomyoma of the Ovary.—H. E. Himwich (*Journal of Cancer Research*, July, 1920) reports a case of rhabdomyoma of teratomatous origin of the ovary in an infant. Cells were discovered in the tumor which are found exclusively in rhabdomyoma of the heart, and the fact that there was branching in some of the fibres led the author to conclude that the tumor described arose from the heart muscle.

NEW ASPECTS OF MENSTRUATION

Based on an Analysis of the Menstrual Fluid.

BY JAMES OLIVER, M. D., F. R. S. (Edin.),
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The menstrual fluid, amounting to seventy ounces, of which an analysis was kindly made for me by Dr. Francis Goodbody of University College, London, was preserved for examination with thymol and was obtained from a girl of eighteen who had never seen her menses because the hymen was imperforate. This girl for eighteen months before coming under my care had complained of periodical attacks of pain in the abdomen and back which had recurred regularly every month and had on each occasion continued more or less severe for five days. The pain was always worse in the abdomen but was never accompanied by sickness and sometimes she stayed in bed two days out of the five on account of the pain which was always greatly relieved by hot applications to the abdomen. For six months she had remarked that her abdomen was getting larger and for this same length of time she had a more frequent desire to pass urine. On March 1st and during the four succeeding days she had one of her usual attacks of pain and when I examined her seven days later the physical signs then noted were the following:

As the patient lies on her back the anterior abdominal wall in the hypogastric and umbilical regions is pushed markedly forward by a large and somewhat ovoid swelling which extends out of the pelvis and reaches to two inches above the umbilicus. From it there can be elicited an ill defined feeling of fluctuation. The vagina is completely closed by a bulging membrane of apparently great thickness and on the surface of this membrane in the centre is a deficiency of material which looks like the spot where the perforation of the hymen should have been exhibited.

On March 15th, ten days after what undoubtedly was the last menstruation, I made a crucial incision through the thick and tough imperforate hymen and collected seventy ounces of menstrual fluid. Without further interference—no douching even—the patient was returned to bed and from six hours after the operation there was no discharge whatever until April 13th, when without pain the menstrual discharge made its appearance and continued in evidence for five days. This discharge, during the first four hours, was rather watery and of a pale red color, but thereafter and until it ceased it was of a dark cherry red hue. Judging from the patient's records of confinements to bed on account of pain before the hymen was incised, the menstrual cycle was one of about thirty-one days, but it will be observed that the first menstruation after the evacuation of the retained menstrual fluid was twelve days late. This I attribute to the fact that the uterus which was somewhat hypertrophied, took, after the evacuation of the retained fluid, ten days to return to a normal size.

DESCRIPTION AND ANALYSIS OF THE FLUID.

The fluid as it flowed through the incised hymen presented from first to last the same appearance

and was throughout of a uniform consistence. These are noteworthy points because fresh menstrual fluid must have been poured out ten days before the retained fluid was evacuated and because quite as much of the fluid had been pent up in the uterus itself as had actually accumulated in the vaginal sac. It is truly remarkable that the fluid as it escaped showed no evidence that the portion which must have been in contact with the imperforate hymen for two years or more was of a different character or different age from that which came from the cavity of the uterus. It was thick like treacle and tenacious and diffusion could have played no part in establishing its homogeneity. It exhibited no free fluid and there was not a trace of blood clot to be seen. It was of a dark reddish brown color with light nut brown streaks through it. The nut brown strata were probably due to hematin. After the fluid had been kept thirty days the nut brown streaks had disappeared and the color was uniformly dark reddish brown of a slightly deeper hue than when fresh. The fluid showed a faintly alkaline reaction. It gave markedly the spectrum of hemoglobin and on qualitative examination it was found to contain a large quantity of albumin. The fluid poured sluggishly but on the addition of water it became perfectly fluid.

Quantitative examination disclosed the following: specific gravity 1031, water 87.13 per cent., and solids 12.87 per cent., consisting of organic material 95.02 per cent. and ash 4.98 per cent. Further analysis showed: serum albumin 12.49 per cent., serum globulin 16.56 per cent., mucin 3.37 per cent., and fat 0.0051 per cent.

The inorganic ash contained sodium, potassium, calcium, magnesium, phosphorus and iron and the salts present were principally sodium chloride and sodium carbonate with small amounts of phosphates and sulphates. It is extremely doubtful whether the fluid contained iodine and after repeated testings it was determined that if iodine was present the amount was so small that it could not be estimated. It contained no arsenic.

Microscopically large numbers of red blood corpuscles and some leucocytes were seen together with small crystals of hemoglobin enclosed in a colorless matrix.

Judged by its physical characters we have no reason to believe that the retained menstrual fluid had ever at any time behaved as blood poured out from broken down capillary vessels would or should have done. Its consistence like that even of menstrual fluid retained in the uterus alone was such that diffusion could not possibly have played any part in establishing its distinctive glutinous character. Moreover, the pressure exerted by seventy ounces of fluid, which after distending the vagina had so accumulated in the uterus as to form an abdominal tumor almost as large as an adult head, must necessarily have prevented the periodical degenerations and disintegrations of the endometrium and the concomitant capillary hemorrhages to say nothing of the recuperation and healing month after month of such devastated structures. As a matter of fact the continued recurrence of menstruation in marked cases of retained menstrual

fluid is only conceivable on a secretory hypothesis.

Again on scrutinizing the analytical findings there cannot be the least shadow of a doubt that the retained menstrual fluid was not and never had been blood poured out by broken down capillary vessels. We can at the outset banish from our minds the question of the probability of any admixture of vaginal secretion modifying or affecting the fluid, since there could have been to all intents and purposes no secretion from the vaginal mucous membrane as otherwise, because the vagina had never been anything but a closed sac, the secretion would have been accumulating for at least thirteen years before menstruation set in and that secretion could not possibly have diffused through the fluid of the recurring menstrual periods. It will be remarked that the specific gravity of the fluid, 1031, is much below that of normal blood, the specific gravity of which averages from 1055 to 1060 and that the quantity of serum albumin in 12.49 per cent. is half as much again as that found in blood serum. The mucin content, 3.37 per cent., is remarkably high and no doubt the viscous character of the fluid—homogeneous in this respect—was largely if not entirely due to the presence of that substance, and there can be no gainsaying the fact that the mucinogen which is the precursor of mucin was secreted simultaneously with the menstrual fluid and was not added afterwards, for as I have already observed diffusion could have played no part in establishing the homogeneity of the fluid. By the hypobromite test, moreover, there was no evidence that the fluid contained urea, neither was there any evidence of the presence of sugar nor of cholesterol.

It is noteworthy that there was in the fluid an abundance of hemoglobin and hemoglobin products. Regarding the presence of hemoglobin crystals I would remind my readers that in the laboratory it is an extremely difficult matter to obtain oxyhemoglobin or hemoglobin crystals from human blood. That hemoglobin in some remarkable way plays an all important rôle in the phenomena of menstruation and in the function of gestation is certain. In cases of pronounced anemia and chlorosis, for example, it is common knowledge that menstruation is often suspended for a greater or less length of time and only becomes reestablished under such circumstances when the hemoglobin content of the red blood corpuscles has been adequately improved and increased. That hemoglobin plays a most important part in starting and carrying on gestation there can be no doubt, for the oxidative processes and powers of the uterus must be enormously increased at this time and from the hemoglobin the fetus derives the iron it stands in need of for its immediate and future requirements.

Confronted with such facts as I have here detailed there clearly is no justification for clinging to the belief that menstrual fluid is purely and simply blood poured out by vessels which have been opened into in consequence of a degeneration and disintegration of the mucous lining of the uterus. On a secretory hypothesis alone is it possible to account for the great variation in the amount and in the physical characters of the menstrual fluid,

not only in different individuals but in the same individual at different times and even during the same menstrual period.

In dealing with the question of the mechanism whereby the different bodies entering into the composition of menstrual fluid are produced we are dealing with a problem vastly more difficult than that concerned in the production of milk but by careful clinical observation valuable light may eventually be thrown on this all important matter.

123 HARLEY STREET.

DIFFERENTIAL DIAGNOSIS BETWEEN DISORDERS OF THE PELVIC ORGANS IN WOMEN AND OF THE ABDOM- INAL VISCERA.*

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An accurate diagnosis of abdominopelvic conditions is of the utmost importance for the proper treatment of disease. An inaccurate or careless study of such conditions will result in unnecessary or improper operative procedures. Certain groups of subjective and objective symptoms are often associated with diseased conditions in such a fashion as to present an almost absolute physiognomy of the disorder. I once heard a prominent surgeon say, "A woman, fair, fat and forty belching; gallstones." This diagnosis may be found true in the majority of such cases but it is a dangerous assumption, and capable of much harm. The surgeon who operates on such a conclusion is executing sentence on the victim on circumstantial evidence.

Gastric distention, discomfort after eating, dyspepsia, frequent and ineffectual efforts to yawn, frequent eructations, are all indications of gastric, duodenal and hepatic disorders, and with the exception of jaundice may arise from the pressure on the sigmoid or rectum of a large retroverted uterus or one with a fibroid in the fundus. Such pressure by interfering with the transmission through the tract of its contents through reversed peristalsis refers the discomfort to the upper abdominal portion of the alimentary canal. Such pressure, by interfering with the pelvic circulation, is also a frequent cause of hemorrhoids, fissure and pruritus ani. It must become evident, then, that no woman should be subjected to operation on either end of her gastrointestinal canal or the adjacent structure at the upper end, the gallbladder, until a careful bimanual investigation of her pelvic viscera has been made. I recall a sister, who came to this hospital from Baltimore and was referred to me for treatment of hemorrhoids, in whom an examination disclosed that the cause of the hemorrhoids was the presence of fibroid growths filling up the pelvis. The hemorrhoids were in evidence but operation on them alone would have been unsatisfactory as the injured rectal structures under such circumstances are slow in healing.

The recognition of retrodisplacements and enlargement of the uterus from whatever cause is readily determined by careful bimanual examination. While the evidence of such a condition does not preclude the simultaneous occurrence of abnormal conditions in the upper abdomen, the procedure necessary for its relief affords an opportunity to explore the entire abdomen and determine abnormal conditions affecting gallbladder, duodenum and stomach, and possibly save the operator from the mortification and discredit of knowing that he had subjected the patient to an unnecessary operation.

Probably a more frequent cause for error in diagnosis is the presence of pain or discomfort in the right lower quadrant of the abdomen. In the female, the gallbladder, kidney, ureter, appendix and uterine appendages must all be kept in mind as possible causes of discomfort in the right side. Inflammation of any of these structures may cause such discomfort. That the general surgeon often errs is shown by the frequency with which women are subjected to operation for removal of the appendix, without obtaining relief from the discomfort for which the surgeon was consulted, subsequent examination disclosing evidence of tubal inflammation from which relief is obtained only by another operation for the removal of the offending structures.

Such experiences demonstrate very clearly the necessity of a careful study of the individual patient; nothing should be taken for granted. Disease of the adnexa is too easily excluded by abdominopelvic examination to justify the operator in overlooking its existence and thus subjecting the patient to an unnecessary operation upon the appendix or an inadequate one in the sense that equally serious conditions are overlooked. Lesions of the urinary tract should be suspected when the kidney is palpable as an enlarged, tender and dragging organ. The urine is likely to contain pus and blood and the frequency of micturition points to irritation of this tract. Rarely, an appendiceal abscess will involve the peritoneum over the ureter to such an extent as to simulate ureteral disease. I had a case of carcinoma of the appendix in which the carcinoma had infiltrated the peritoneum and through it the wall of the ureter. The patient died from a recurrence of the disease.

Malignant disease of the ovary, or of the intestines, may present conditions rendering difficult a definite diagnosis previous to abdominal incision. Malignant disease of the ovary presents no distinctive symptoms from an ordinary ovarian cyst, until it has infiltrated the wall and extended to the surrounding structures, or has ruptured, producing a more disseminated spread of the disorder attended with ascites. In addition to the mass which can be palpated in the pelvis, such patients present palpable evidence of secondary nodules through the peritoneum and especially marked infiltration of the omentum. It seems a part of the function of this structure to aid in covering up and assist in forming a guard against the spread of infection. I have seen the omentum, having wrapped up within its folds a suppurating appendix, closing

*Read before the St. Joseph's Hospital Clinical Society, June 8, 1920.

every avenue for the further spread of the infection; so it is also seen enveloping a threatened rupture of a malignant ovary and itself receiving the charge which led to its infiltration. In the majority of cases of malignancy originating in the intestine the cell infiltration leads to early constriction and obstruction of the intestine before there is infiltration of the surrounding structures. Here the signs of obstruction and reversed peristalsis soon occur. The natural tendency of all enlargements of the adnexa and intestines is to drop into the retrouterine pouch and as the disease progresses they become adherent and sooner or later lead to infiltration to the adjoining structures forming a mass which adds to the difficulty of diagnosis.

The progress of the condition originating in the ovary may be much slower in its progress and be attended with greater accumulations of ascitic fluid and not infrequently great distention of the intestines with gas. Many cases illustrating these conditions which have occurred in the last few years come to mind, three of which I will present.

CASE I.—Mrs. S., aged forty-eight, referred February 22, 1919, by Dr. Goldberg, had been pregnant twice, delivered at full term with natural labors. A curettage followed the last. Menstruation was regular, lasting four to five days; no leucorrhœa. Bowels had always been regular, but she was unable at the time to have a movement because of some obstruction. Her abdomen was greatly distended especially at the upper part. She gave a history of having had an operation last June when, her daughter informed me, it was necessary to suture the bowel in two places. Examination revealed a mass in front of the rectum which pressed upon it and was evidently the cause of the obstruction. On February 27, 1919, she was operated upon in St. Joseph's Hospital. A median incision discharged a large quantity of ascitic fluid and the pelvis was found filled with a mass of cancerous growth involving both ovaries with secondary nodules in the peritoneum of the bladder and other points. The omentum was extensively infiltrated. The uterus contained fibroid growths. I pulled the mass out of the pelvis, removed both ovaries and the fundus uteri; covered the raw surfaces with peritoneum and closed the abdomen after having irrigated the belly with hot saline solution. Her condition was so bad that we resorted at once to intravenous injection. The patient recovered from the operation and was first seen at my office doing fairly well, on April 18th, and again on June 23rd and July 17th, feeling quite uncomfortable. There was evidence of a return of the mass in the pelvis. On July 22nd I tapped her in my office and drew off about a gallon of fluid. I tapped her again on August 4th, when nearly as much fluid was withdrawn. Dr. Richards subsequently attended her at her home and I saw her with him October 17th. I believe she lived over the end of the year but was uncomfortable all the time.

CASE II.—A colored woman at the Jefferson Hospital had undergone operation nearly a year before when Dr. Bland removed the fundus of the uterus for fibroids. Her abdomen was quite distended and a mass could be felt in the pelvis. The

abdomen was opened which revealed carcinoma of the ovaries. The mass was removed and the patient recovered and left the hospital. Two months later this woman returned with ascites. Examination revealed that there was a recurrence of the growth in the pelvis. After an evacuation of the fluid by trocar this patient was lost sight of.

CASE III.—On October 1, 1919, Mrs. G. came under observation. She was forty-seven years old, pregnant three times, in all of which she went to full term. She had not menstruated for a year, and did not show leucorrhœa. She had been obstinately constipated and without urinary disturbance. She had pain in the lower abdomen. My notes say that the examination disclosed a fibroid in the posterior wall of the uterus and hysterectomy was advised. The obstruction was ascribed to the pressure of the mass on the sigmoid.

On November 13, 1919, it was noted that the patient had had no movement of the bowels since I last saw her, which made the necessity for relief very urgent. At St. Joseph's Hospital, the abdomen was opened in the median line which revealed that the mass was a tumor between the rectum and the uterus adherent to both. The principal mass was found to be a carcinomatous involvement of the ileum which had dropped down and become adherent and infiltrating the tissues with which it lay in contact. Both the posterior wall of the bladder, the fundus and posterior surface of the uterus and the anterior surface of the rectum were involved. I resected the ileum and made an end to end anastomosis, cut away the peritoneal surfaces of the rectum and fundus of the bladder and removed the uterus. Proctoclysis was instituted at once. She had some distention on the second day but was given fractional doses of calomel every fifteen minutes and saline following. She had five movements of the bowels the next morning and improved steadily. A week after the operation she had a very offensive discharge from the vagina. It was so foul that the intern attributed it to a fecal fistula, but it was evidently due to colon bacillus infection and soon cleared up. She soon had a recurrence of the disease and although she lived some months her condition was so uncomfortable that one could not but regret that she had not been permitted to die without the first operation.

These cases are not reported on account of the successful result of the operative procedures, but for the purpose of illustrating the difficulties of diagnosis. A proper diagnosis is of importance to determine not only the condition but to be able to advise as to whether any operative treatment should be employed.

Pregnancy often affords a cause for error in diagnosis of supposed appendicitis. If the tumor is a fibroid, a subperitoneal one, as the uterus increases in size such a tumor may be squeezed between the developing uterus and the bony pelvis or abdominal wall and the pressure thus induced lead to its being pressed into the uterine wall like a cork in a bottle until its circulation is cut off and it begins to set up inflammation as a foreign body. The pain, tenderness and muscular rigidity frequently lead to the diagnosis of appendicitis. I have seen three

such patients, two of whom were subjected to operation for supposed appendicitis. In the third case, recognizing the condition, I attempted to carry the patient along by pushing up the uterus to release the pressure but the condition caused an abortion and the condition had become so disturbing as to later require an abdominal hysterectomy.

Ordinarily in acute appendicitis complicating pregnancy, the cecum generally being somewhat fixed, the gravid uterus lies in front of it and consequently the pain may be aggravated by making pressure over the uterus or in pushing behind the uterus. In a fibroid causing the condition the pressure and pain are more anterior to the position of the appendix.

1426 SPRUCE STREET.

RECENT ADVANCES IN OBSTETRICAL PRACTICE.*

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Obstetrics has become a specialty. The obstetrician is no longer a medical man, but an obstetrical surgeon. We have passed out of the period of the midwife; the public demands a specialist, and he must be fully equipped with a training in the fundamentals of the science and art of obstetrics, general and special diagnosis, and an appreciation of the principles underlying obstetrical surgery.

The existence of the trained obstetrician is justified, if he is able to produce a living child with a reasonable certainty of life, with less mortality and morbidity to the mother, and has the ability to restore the parturient woman to the proper economic state of health, and as perfect anatomically as before she was delivered.

Prenatal care is the right of every prospective mother. This does not mean an occasional examination of the urine when we happen to remember to make one, and a record of the expected date of confinement, but a searching and painstaking examination of the individual. This investigation should not only include an examination of the heart, lungs, kidney, and other general condition, but of the thyroid and kidney function, repeated estimations of the phthalein elimination and its relation to the blood pressure, and a routine blood Wassermann test, together with careful observations as to the development of the pregnancy, inquiry into the character of the discharges, and a bacterial examination of these discharges; and finally, the diagnosis of the presentation, position, posture, and pelvic mensuration of both the pelvic brim and outlet. For not only has the child to enter the bony pelvis, but it has also to pass through it and get out of it, and this can only be determined by a proper appreciation of the relative size of the child to the mother's pelvis.

This prenatal investigation permits us to discover syphilis; prevents the occurrence of eclampsia; allows the recognition of malpositions and dispro-

portion, and thus minimizes the difficulties of labor. Being thus forewarned, we are forearmed for any emergency, and consequently we know how to conduct the labor in the best interests of both the mother and the child.

Nothing has done so much to improve both maternal and fetal mortality as accurate prenatal work. In our clinic at the Long Island College Hospital, in over five thousand consecutive cases in which there had been done the most careful antepartum work, including routine salvarsan treatment of all syphilitics, there were but two per cent. of stillbirths. No case of eclampsia occurred in this series, and the operative procedures were reduced to a minimum; while the mortality and morbidity were both lowered.

Next in importance is the prevention of infection, and no one procedure has contributed so much to the diminution of this serious complication, which alone causes over ten thousand deaths annually in the United States, as the routine employment of abdominal diagnosis and a rectal examination following the course of ordinary labor.

While it has been contended by those who are making routine vaginal examinations that it is safe under proper precautions to enter the vagina at will, or at least as freely as is necessary to follow the advance of labor, our experience has shown us that not only the morbidity but the mortality has actually been reduced by the adoption of routine rectal examinations. The vulva and vagina are the constant habitat of bacterial flora which are readily carried into the uterus by vaginal examinations. This can be absolutely prevented by confining our explorations to the rectum. One can follow the course of labor by rectal touch after very little experience, and determine the dilatation of the cervix, the descent of the head, the rotation of the vertex, with almost as much accuracy as by vaginal feel. Only when the progress of labor has become arrested, is it our custom to make a vaginal examination. When this is necessary it should be made a surgical procedure. The patient's vulva is clipped, scrubbed, and sterilized. The examining hand is scrubbed and gloved, and with the patient under an anesthetic, a careful examination is made and the cause of the dystocia determined. Besides this, an accurate knowledge of the physiological processes of labor is essential, for labor is a mechanical process.

In the ordinary obstetrical case when the woman falls into labor, if she is a primipara and there is no disproportion, the head should be in the pelvis; while in the multipara, during the stage of dilatation, or shortly after dilatation is complete, the head either engages in the pelvis or it does not. This is fundamental. It would engage if it could, and if it does not, there is some defect in the power, the passage or the passenger. Consequently every labor must be studied and conducted in such a way by our knowledge of the presentation, position and posture, the preservation of the membranes, the maintenance of absolute asepsis, and the conservation of the nervous energy of the patient by rest.

Should intervention be demanded in the interest of mother or child, such operation can be done with

*Read at the Centennial Meeting of the Oswego County, N. Y., Medical Society, October 13, 1920.

the greatest margin of safety. Anodynes and analgesics are absolutely necessary for the patient's comfort in every prolonged labor; for certain mechanical processes must be effected in order that the child may pass through the pelvis, and these take time to accomplish and require active labor pains; and pain exhausts. The steps of the mechanism occur after there is dilatation of the cervix and the presenting part passes the brim and reaches the pelvic floor; this in turn is followed by dilatation of the vulva outlet. When the head passes out of the cervix, the uterus moulds itself about the child, and this interferes with the uteroplacental circulation, hence the importance of an accurate record of the fetal heart, its action under the influence of uterine contraction, and its reaction during the periods of uterine rest, are essential in order to estimate the effect of labor on the child.

With this knowledge, should the necessity for operative intervention arise, the woman is reasonably safe, for the child is in good condition, the woman's strength is not exhausted, infection has been minimized, and sufficient time has been given to accomplish the opening up of the soft parts by Nature's processes, consequently it may be deduced that every obstetrical case unless the delivery is spontaneous, will fall into one of two general classes, namely, either the child will come into the pelvis and providing the outlet is ample allow of infravaginal delivery, or it will fail to enter the pelvis when supravaginal delivery will be necessary.

In the first class, where infravaginal delivery is possible, certain essentials must be observed in order to have a favorable outcome. First of all, the cervix must be fully dilated and this takes time; to give this time to the patient, and yet conserve her nervous energy requires the use of anodynes. Here morphine and scopolamine used judiciously have given the greatest comfort to the woman, and have accomplished much which could not have been done without their aid.

Secondly, the membranes should be preserved until complete cervical canalization has been accomplished. The patient's comfort may be further advanced by keeping both bladder and rectum empty. A tight abdominal binder aids materially in crowding the head into the pelvis besides maintaining flexion, and it further maintains a better driving axis for force of the pain. Not until the head has reached the spines or has passed them should forceps be resorted to, for in good practice today median and high forceps are seldom if ever used. Both of these procedures have a high fetal mortality. On the other hand, low forceps is a life saving operation, and should be frequently employed, more frequently, perhaps, than at present, when the head is at the spines or below them and the cervix is fully dilated, and the outlet is ample; for many children lose their lives after they have reached the pelvic floor by too long delay in the perineal stage. Furthermore, the fascial sheets become overstretched and pelvic relaxation follows. Both Pomeroy and DeLee have called attention to this and have suggested prophylactic forceps and perineal section in the interest of the child. This perineal section may be done through the median

raphe or laterally, and so remove the soft part dystocia which is jeopardizing the fetal life.

Probably no advance in obstetrics has been so great as the recognition of danger to the child by routine auscultation of the fetal heart done at regular intervals throughout the entire perineal stage, as by this means we are able to recognize cord complications as coils, short cord and shoulder cord, by the arrhythmias and souffles and so terminate labor promptly in the interest of the child. Only in funnel pelvis where the outlet is contracted, namely, when the bischial and posterior sagittal diameters total less than fifteen, is infrapelvic delivery of the engaged head by forceps absolutely contraindicated. It is here with a contracted outlet, with the head well in the pelvis, at or below the spines, and a living child, that pubiotomy has its principal indication. Hebosteotomy is also permissible in occipitoposterior positions of the vertex arrested at the pelvic outlet by contracted hard parts.

Again, in mentoposteriors impacted in the pelvis with a living child, by increasing the size of the pelvis by pubic section the chin may be successfully rotated. Pubiotomy is not fraught with the serious dangers that we have been told about, and, while the field is limited, it has a distinct place in obstetrics, and in certain outlet contractions we may frequently be able to save a child without excessive trauma by its adoption. Do not for a moment understand that we place pubiotomy against Cæsarean section. To make pubiotomy successful, the head should be well in the pelvis and arrested at the outlet, while Cæsarean section has its chief indication in arrest of the head at the brim. In the past few years, indications for Cæsarean section have been broadened; not only is suprapubic delivery done for contracted pelvis, but for many relative conditions in the interests of the unborn child.

Davis has successfully used it in the treatment of placenta prævia. Occasionally it is of value in prolapse of the cord. Peterson has recommended it in eclampsia, and many operations have been done because of soft part dystocia. Many of these dystocias have been brought about by the procedures used for the correction of retroversion, such as the so-called suspension of the uterus, and have contributed a very large percentage of these dystocias which have necessitated the delivery of the child by the suprapubic method.

Cæsarean section is not without danger. In the collective records of two thousand cases of various operators in America, almost all of whom are recognized as obstetrical surgeons, we found that there was a mortality of over eight per cent., with a morbidity of between thirty and thirty-five. This high percentage of mortality and morbidity should not be credited to Cæsarean section, but to the results of not knowing what class of patients would need section before we started.

In our own service, where the prenatal work is exacting, we know practically from the very beginning in what case Cæsarean section will be required. Consequently, our mortality has been lowered as well as the maternal morbidity. If the labor has been conducted along aseptic lines, and the progress watched by rectal and abdominal examinations, the

suprapubic transperitoneal operation may be done at almost any time during labor with a mortality of less than one per cent. Primiparous labors are always trial labors, while in multiparæ we have a history of past performances, consequently these trial labors should be given the trial on aseptic lines and every precaution we can take in the interest of the mother and child is justified.

What runner, what athlete, what horse, what crew goes into the supreme contest without preparation and training; yet many women go into labor without training or even knowledge of what is before them. Potter, of Buffalo, arbitrarily shortens labor by the election of version in every case with no disproportion. While we cannot agree that his teachings are sound, he has certainly succeeded in what he started out to do. Potter is an artist, but who of us can duplicate his record without increasing our fetal and maternal mortality, and we question the advisability of deliberately disengaging the engaged and moulded head and bringing down the feet as a routine, just to relieve the woman of the pain and exertion of the second stage of labor, when by the employment of morphine and scopolamine in the first stage and anesthesia with gas and oxygen or ether and oxygen in the second stage—together with the judicious use of forceps when the head is below the spines supplemented by perineotomy—we can have a fetal mortality of between three and four per cent. or about half of that reported by Potter.

287 CLINTON AVENUE.

THE COMPLETE FORCEPS OPERATION.

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If the histories were taken of patients who had had bad deliveries followed by worse recovery, usually in private practice, and if these histories were analyzed, it would be found that in many cases the circumstances were essentially as follows: There may have been slight disproportion between mother and child, or failure in the development of the natural forces of labor. From whatever cause the mother failed to deliver herself and assistance was required; with the help of a trained nurse only or possibly without such assistance, the attending physician anesthetized the patient and delivered her by forceps. There was more or less laceration, for which an attempt was made at repair. The circumstances were such that this was not done in a manner satisfactory to the physician, for a tendency to postpartum hemorrhage developed in the patient, and it was necessary to check that as soon as possible. The child was injured somewhat, but apparently no permanent results followed these injuries.

Convalescence in this case was prolonged, temperature was higher than normal, and, while the mother nursed her child, her recovery was not complete. Some time afterward, it was found upon examination that considerable tear of the cervix had occurred which had not completely healed, and that

the repair of the pelvic floor and perineum had not been completely successful. For this, secondary operation was required, and in all between one and two years passed before the woman recovered something like her previous health. In other cases there is the distinct history of postpartum hemorrhage after such delivery, or of well defined puerperal septic infection.

If these histories are analyzed, it is found that the primary cause of the unsatisfactory result did not lie with the inefficiency or neglect of the attending physician. He possessed such average knowledge and operative skill as the law demands; he took such precautions as he could to make his operation aseptic. The nurse had been properly trained and did her work as carefully as circumstances permitted. Two factors caused the bad result. One was delay in delivery, for the general practitioner frequently does not recognize symptoms of threatened exhaustion, but waits until the patient is thoroughly tired before interfering. The second factor was insufficient appliances and assistance and an incomplete and a nonsurgical operation. The circumstances were such that an aseptic technic could not be thoroughly carried out and efforts at checking hemorrhage and repair were not carried out in a thoroughly efficient manner.

How can better results be obtained? Must the profession be content with such procedures? The most important factor in all discussion relative to obstetrical practice is the question as to whether obstetrical practice should be put on the same professional level as surgical practice. So long as obstetrics is considered essentially the practice of midwives, and so long as complications in obstetrical cases receive adequate attention as a last resort only, no improvement can be expected. When cases of abnormal labor are treated by obstetricians in properly equipped hospitals, or when the obstetrician takes to the private house the necessary equipment for good work, then, and then only, will substantial improvement occur. In suggesting what can be done in this matter, I advance no theory. I merely state what has been done in my personal experience and observation.

It is most important that signs of approaching exhaustion be detected by nurse and physician before the patient reaches a point where haste may be necessary. Medical teaching should emphasize this fact. When interference is imperative, it must be remembered that a vaginal operation, whereby hands or instruments are passed from without into the uterus, cannot be a strictly aseptic procedure. In the present state of our knowledge, or ignorance, it is practically impossible to invade the uterus through the vagina without introducing bacteria. In carrying out the principles of surgery, the operator must remember that in such cases drainage cannot be neglected. Normally the genital track drains after labor by intermittent uterine contraction and by gravity. When interference is practised, these factors must be more than usually developed and additional precautions must be taken.

No more efficient cause exists for the development of septic infection than hemorrhage preceding or accompanying an operation. Hence, to conduct

an obstetrical operation upon surgical principles, the operator must see to it that precautions are taken to avoid hemorrhage and to secure necessary drainage. To bring these observations into a concrete form, the following technic has been successfully practised for a considerable period of time:

A thorough examination of each patient and as careful and complete a history as possible will show the shape and size of the birth canal, the strength and development of the mother, and approximately the size of the child. With these data symptoms of exhaustion in labor are carefully watched for and recognized as soon as possible. The forceps delivery is never attempted unless the head is well engaged and the birth canal dilated or practically dilatable. It is unnecessary to give details of hospital technic. In operating in private houses a portable sterilizer is necessary. Gowns, dressings, and other appliances may be sterilized in a hospital and taken to a private house, carefully protected from contamination. Boiled water and antiseptic fluids can be procured. A kitchen table, suitably prepared, makes a good operating table. Such matters of aseptic technic as are necessary can readily be managed, provided the operator is willing to take the trouble and give the attention to the problem.

It is especially important that a competent anesthetist, who has had obstetrical experience, and an additional nurse be at hand. Ether-oxygen is the anesthetic of choice, and in giving anesthesia for such an operation, obstetrical experience will indicate when the anesthetic is to be pushed and when its administration may be relaxed. Furthermore, the obstetrical anesthetist must be competent to observe with his hand the contractions of the uterus and the downward passage of the child. He must also be able to take charge of the patient immediately after delivery, watch her general condition, and recognize symptoms of threatened shock or hemorrhage.

The additional nurse should have had experience with the individual operator. She should have charge of his instruments and appliances, be responsible for their condition and sterilization, and be able to assist in the operation. The nurse who has charge of the patient will have enough to do in the general care of the mother and the infant.

Elaborate appliances are unnecessary. The legs of the patient can be held in position by the use of a folded sheet, and it is not the number or elaborate character of instruments or appliances which is of value, but the judgment and skill of the operator, the fact that he places his patient under the best possible conditions for operation and that, in justice to himself, he has adequate assistance.

It is not my purpose to describe delivery by forceps. Attention is directed, however, toward what should be done after the delivery of the child. The uterus, having been invaded, may be considered as possibly infected. Sufficient time should elapse after the birth of the child before an attempt is made to deliver the placenta. Should hemorrhage begin, this should be done at once by the introduction of the gloved hand. If conditions are favorable, the operator may wait from ten to twenty minutes with the

patient partially anesthetized before delivering the placenta. If the hand is introduced, it is well to note the location of the placenta as a guide for further procedure.

The uterus having been emptied, strychnine and aseptic ergot should be given by hypodermic injection. The uterus should be irrigated with one per cent. lysol solution and thoroughly packed with ten per cent. iodoform gauze. After trying various ways, I have discarded specula and tenaculum forceps and introduce the gauze with the left hand, while the right hand places the gauze in the fingers of the left and, by pressure on the uterus, aids in placing the gauze accurately. We have found by observation that the recently emptied average uterus will contain and retain a strip of gauze nine inches wide and four yards long. Where relaxation is threatened, more may be required; in rare cases, less is used. The advantage of this procedure is its tendency to prevent postpartum hemorrhage and the fact that the gauze acts as an efficient antiseptic drain.

Following the introduction of the gauze, the cervix is drawn down by tenaculum forceps, inspected, and, if torn, the lacerations are closed. No. 2 chromicized catgut is employed. The cervix is then released, the uterus carried forward in the pelvic cavity, the cervix pressed backward by aseptic gauze packed in the upper vagina and the uterus is watched by the hand of the anesthetizer. The pelvic floor and perineum are then inspected. The lacerations are closed. In the majority of cases in primiparæ the median incision will greatly lessen injury to the pelvic floor and perineum. The gauze is then removed from the vagina and a vaginal douche of one per cent. lysol is given. A strip of bichloride gauze is then tied to the end of the iodoform gauze within the uterus and the cervix is carried backward and the uterus put in normal position by this moderate vaginal packing of bichloride gauze. If the patient requires stimulation, this should be given by hypodermic injection before she leaves the operating table. In cases where it is desirable to leave the patient undisturbed so long as possible, she should be catheterized twice, just before the operation and at its conclusion.

It may be urged in criticism that this is meddling midwifery; that in many cases all that is needed is to extract the head and that such a procedure is more dangerous than beneficial. So long as human beings remain as they are now, it will always be possible to say that if a physician had not interfered, a different result might have occurred. We can only reason from a considerable experience and avail ourselves also of the recorded experience of others. Meddlesome midwifery consists in repeated vaginal examinations, infrequent and futile attempts to dilate the cervix and in unsuccessful application of the forceps.

A very practical question would indicate that such a procedure might be followed by the development of septic infection. After a considerable personal experience, both in private and hospital practice, and with the accumulated experience of those who work with me, it has been shown that this is not the case.

We have yet to find a case in which it could be shown that septic infection has developed in the patient following this procedure. Our experience indicates that this is beneficial and successful in preventing relaxation, hemorrhage and infection and in securing primary union of lacerations and in promoting complete recovery of the patient. It is also of some importance that under such precautions an accurate and proper application of the forceps to the child's head is more readily made than when the operator is at a disadvantage and also that those precautions which protect the mother from infection, give like protection to the child.

In after-treatment the gauze is removed in from thirty-six to forty-eight hours. If the upper gauze is dry and clean on removal, it is unnecessary to irrigate the uterus. If there are particles of decidua or membranes on the gauze, it is well to irrigate the uterus with one per cent. lysol solution. No other douching is practised. After the operation tonic doses of strychnine are given, to which some form of digitalis is added, if needed. In our experience, after-pains are caused by faulty contraction of the uterus and the presence of clots. It has been interesting to observe that under this method pain after delivery is rare. After the removal of the gauze, strychnine and ergot, in moderate doses, are given for a week or ten days. External stitches are removed in from seven to ten days; internal catgut stitches are absorbed.

An interesting and natural question arises. Will patients pay for the trouble, attention, skill and expense which such a procedure involves, in hospital or in private houses? The anesthetist must receive compensation, and the whole procedure calls for more expense than the public expect in an ordinary case. Under the usual circumstances, physicians realize that they will receive for their services only such compensation as the profession asks and as people under ordinary circumstances are willing to give. For years the profession has held obstetrical practice to be the cheapest sort of medical work, and the public have held that as the production of the child is thought to be a natural process, therefore it should be cheap. Much of the injustice and negligence of the present can be traced to these two causes. At present the majority of patients on first confinements go to hospitals. All of them should do so. All patients, whether in first or other labors, in whom there is any reason to suspect complications, should be sent to hospitals for their confinement.

If it is necessary to operate in private houses, it should be distinctly made clear that the operation is as difficult, responsible, and expensive as the removal of the appendix or the removal of a complicated ovarian cyst would be in a private house. Payment will be made for the removal of an appendix or cyst because it is not believed the appendix or cyst will return. If a higher value can be placed on human life, the public may be brought to believe that it might be well to pay adequately for the safe removal from the body of a mother of a child, although there may be others later. The mother's health is also of value.

250 SOUTH TWENTY-FIRST STREET.

SEVERE PELVIC INFECTION FOLLOWING HYSTERECTOMY.

*Report of a Case Where Radium Had Been Used
Two Weeks Before Operation.*

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The time when the report of a single case history could have any interest to the medical profession is long since passed. We think in big figures these days, and do things in a large way. However, it would seem that an intensive study of a case illustrative and suggestive of so many diverse aspects might be a source of fruitful thought not only to those who devote their time so largely to gynecology and obstetrics, but also to those in general practice. The case here reported seems to bring before us clearly the following gynecological needs and problems:

1. The extreme importance of surgical judgment at the time of the first operation, so that gynecology is not subjected to disrepute and ill fame, by the unnecessary need of an almost immediate secondary operation for conditions which existed, and whose cause existed, at the time of the first operation.

2. That a focal infection of the cervix will always continue to be the cause of further trouble until it is completely eradicated, as has been pointed out by Sturmdorf (1 to 5), myself, and others.

3. The importance of a more careful diagnosis of cancer before much dependence can be placed upon reported cases of improvement from the use of radium treatment.

4. Can the use of radium cause the lighting up of a subacute or chronic pelvic inflammation into an acute one, as Graves (6) suggests?

5. How long should we wait before operating after radium has been used in cases of pelvic infection?

CASE.—Miss W., aged thirty-seven; past history and family history were negative, except for appendectomy twelve years ago. Present trouble started about a year ago, and consisted of severe pain in the abdomen at times, which the patient said was not always in the same place. About six months ago the patient was operated upon for some pelvic condition at a hospital in St. Paul. She was better for about two months and then the pain returned. The history of the previous operation was not very complete, but the diagnosis from that hospital was "right ovarian cyst and double hydrosalpinx." The report of the operation was "double salpingectomy, ovariectomy and removal of cyst." After this first operation the patient had a slight amount of fever for several days without a wound infection. This rise in temperature was probably due to a mild pelvic infection. The patient was referred to me in May, 1920, by her physician, Dr. Thelberg, on account of the return of the pain in the right side. This pain was worse at the time of her menstrual period. Pelvic examination disclosed an irregular, firm mass rather low down in the right pelvis, which was only moderately sensitive to pressure. The uterine body was normal in size and consistency,

but was displaced, either by this mass or from adhesions, to the patient's left side. Inspection of the cervix showed a nonlacerated but markedly infected cervix from which an almost mucopurulent discharge was issuing. A diagnosis was made of cystic right ovary which had been left at the time of the previous operation, and an infected cervix. Operation was advised and good prognosis offered. The patient did not act upon this advice but consulted several other surgeons who, I understand, considered the condition a recurrent cystoma. She then had one application of radium to the right external abdominal wall. About two weeks later the patient returned and again sought my advice, and was again advised to allow me to operate upon her. The patient entered the hospital on May 4, 1920. Physical examination was negative except for the patient's pelvic condition. The uranalysis showed: Color yellow, appearance slightly cloudy, reaction acid, specific gravity 1,032, no albumin, no sugar, no indican, no acetone, no crystals, no casts, many squamous cell epithelium, few pus cells. Repeated examinations of her urine all showed similar findings, except for slight trace of albumin after the operation.

Operation: Surgeon, Dr. Langstroth; anesthetist, Dr. Coburn; anesthetic, gas-oxygen-ether q.s. nitrous oxide-oxygen. Hysterectomy, begun at 9.15 a. m. and finished at 11.15 a. m. The left tube and ovary were missing and a peculiar thickened inflammatory condition of all the pelvic tissues was noted. The appearance of the tissues while hard to describe, differed from that of ordinary subacute inflammation of these tissues. A multiple cystic right ovary was found. This was bound down, back of the uterus, with inflammatory adhesions. The tube and uterus were involved in adhesions so it was thought best to remove the whole mass, supravaginally. The cysts contained what appeared to be clotted blood, but may possibly have been corpus luteum cysts. The endometrium of the cervix was cored out from above in order to remove this infected tissue, and a drain was left through the cervical stump. The abdomen was closed in the usual manner. The condition of the patient at the end of operation showed respiration 20, and pulse 120.

REMARKS.

The case was not inoperable in the sense that there was any outgrowth of malignant tissues into the pelvic tissues and there was no reason to expect any return of the trouble. An examination of the specimen showed the tube to be thickened and inflamed, otherwise negative, and the uterus normal. In the rest of the mass there was nothing to suggest a malignant condition. It was not malignant in the sense of being a solid sarcoma, or carcinoma of the ovary; however, as many of these cysts are of an adenocarcinomatous type, a specimen was sent to the laboratory for microscopical diagnosis. A report of the microscopical examination showed that there was no reason to expect any second or malignant growth in this case.

This patient started to show a septic temperature almost immediately after the operation. The first day at 4 p. m. it reached 100.1° F., the following afternoon at 4 p. m., 102.1° F. On the fourth af-

ternoon, however, it was only 100.2° F., and on the morning of the fifth day it was 98.2°. The packing was removed at this time, and the temperature went up to nearly 102° in the afternoon. At this time the patient complained of some pain in the lower abdomen. Examination disclosed rigidity of the abdominal muscles. The following day the temperature in the afternoon was again 101.5°. A mass was now discernible above the pelvic brim and it was seen that we had to deal with a large pelvic abscess. The patient's condition remained about the same, and it was thought best to allow the abscess to become well walled off before operating. On May 17th, thirteen days after the first operation, the dulness had reached above the umbilicus, and it was decided to operate at this time.

Operation: Surgeon, Dr. Langstroth; anesthetist, Dr. Coburn; anesthetic, gas-oxygen-ether q.s. (grams iv). The abdomen was opened and a cervical drain inserted, and a large amount of pus was evacuated from both the abdomen and the cervix. Rubber drains were inserted in the abdomen. Immediate operative recovery was good.

The patient from this time on made a tedious, but progressive, recovery, the only real setback being a slight pleurisy with effusion which cleared up without drainage being necessary. On June 16th the patient was examined by Dr. Satterlee, who reported her to be normal except for a few râles at the right base posteriorly and some dulness in the same area. On June 18th, according to the hospital record, there was a very moderate discharge from the wound and the patient was greatly improved in every way. On June 30th, the patient, who had been walking about the ward for nearly a week, went home. At the present time of writing the patient is in the best of health.

The first point which we wish to consider in studying this case is the importance of correct surgical judgment in connection with gynecological operations, in order that secondary operations may become necessary less frequently, and at the same time we shall consider the second point of importance in this case, i. e., that infections of cervical endometrium are responsible for most of the diseased conditions in the tubes and ovaries.

As has been pointed out by Sturm Dorf (1) and others, cystic conditions of the ovary follow infective endocervicitis very frequently. In fact, the writer is now convinced that this condition is the usual, if not the only, cause of simple follicular and corpus luteum cysts of the ovary. We do not yet know if these infections act in causing cystoma of the ovary, either the simple multilocular cystoma or papilliferous cystoma, which are probably due to an epithelial hyperplasia, although it is reasonable to suppose that the endocervical infection may act as the chronic irritant which induces this epithelial proliferation. The infection from an endocervicitis spreads up through the lymphatics of the cervix, uterus and broad ligament, thus reaching the ovary. There it may cause a thickening of the tunica albuginea delaying or preventing the rupture of Graafian follicles, thus producing cystic conditions of the ovary and causing many of the menstrual disorders which are so common in this class of patients.

In the case under discussion we had to deal with severe chronic endocervical infection, so that it was only reasonable to expect, if much ovarian structure was left after the first operation, that it would still be subject to cystic disease of the unruptured Graafian follicular type. The writer believes that if the infected cervical endometrium had been removed at the first operation this patient would have remained well.

Let us next consider briefly the question of diagnosis. As stated in the history, the patient had been operated upon about four months previous for the removal of a cystic ovary and a resection of the other ovary. The only point not clear was which ovary had been entirely removed. The pelvic examination disclosed a firm moderately sensitive nodular mass in the right pelvis, which, although adherent, did not seem to blend at all with the surrounding tissue, but could be freely outlined. It caused severe pain only at the time of menstruation. Taking into consideration the fact that the patient also had a badly infected cervix, was it not reasonable in the light of our present knowledge, to suppose that a cystic condition existed in the remaining ovary and that this condition should have been considered a nonmalignant ovarian cyst, since the patient's general condition was good, she had not lost much weight, and had no symptoms of peritoneal or bowel involvement, neither did she appear cachectic. Diagnosis of nonmalignant ovarian cyst was confirmed by microscopical findings of the removed ovary. If this patient had not returned for operation the case would have undoubtedly been looked upon as one of recurrent malignant ovarian cyst cured by radium, since the patient probably would have lived without any treatment for many years and remained in a fair condition of health.

We now come to the most important and interesting consideration in this case, namely: Can the use of radium light up a subacute or chronic pelvic inflammation into an acute one, as Graves suggests? I can offer very little information on this point, but call attention to the fact that I have noted, during operation, a peculiar swollen, boggy and friable condition of the pelvic tissues, different from anything I have encountered in chronic pelvic infections. Graves's article had not then been published and I was at a loss to explain this condition which I now believe to have been due to the action of radium on the old chronic pelvic infection from which this patient had suffered for a long time. Graves, after reporting two very similar cases, says (6): "The injurious influence of radium on chronic inflammatory pelvic conditions is perhaps the most important reason why in the extensive clinical use to which radium is destined very soon to be put, its employment, in gynecological practice at least, should be limited to responsible and well trained operators."

In answer to the question, how long should we wait before operating after radium has been used in pelvic cases, it is difficult at this time to express an opinion of any value. The length of time would, of course, depend somewhat upon the urgency of the case, but the writer would suggest that as long an interval as possible be allowed to elapse. The

pelvic abscess in one of the cases that Graves reports did not develop for six months after the use of radium (Case II in the article referred to above.)

CONCLUSIONS.

It would seem that we were justified in drawing the following conclusions from a study of this case:

1. The chronic cervical infections are the cause of a great proportion of uterine, ovarian and tubal disease, and often cause a return of the trouble, if the infected cervical endometrium is not thoroughly removed.
2. The cases for treatment by radiation should be selected most carefully and the ultimate outcome reported.
3. Operation is better than radiation for early or doubtful malignancies.
4. Operations should not follow radiation except after careful consideration of the case, and then only when absolutely necessary.

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TREATMENT OF PUERPERAL INFECTION.

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I wish first to speak of a treatment for puerperal sepsis by an old method which is being revived in France and was first carried out by Prof. Fochier, of Lyons, some thirty years ago. I refer to fixation abscess. The success of this procedure, which is undeniable in the case of puerperal infection, depends upon its early employment, when other ordinary therapeutic measures have failed. An important point to remember is that when an abscess does not form its prognostic value is a hundred per cent.; for it means that recovery will not take place. I shall not take up space with statistics, but would say that out of a total of 132 cases collected by Cassedevant an abscess formed in 113, with nine deaths. In the remaining nineteen cases an abscess did not result and only two patients recovered. The total percentage of recoveries was, therefore, seventy-seven.

In spite of these figures, and many other similar ones could be produced, the procedure has been neglected. It is true that it is painful but this is likewise true of the surgical intervention required in puerperal infection. Energetic treatment can alone give results in serious morbid processes. When it is objected that pain and suppuration, being depressing to the vitality, should cause one to reject this procedure it need merely be remarked that when

neither suppuration nor pain occurs and death ensues, recovery will take place when the injection causes a marked local reaction. However, on account of the violence of the reaction in some cases—severe pain, prolonged suppuration and occasionally some undermining—this treatment should not be resorted to without reasonable motive.

The question of contraindications for fixation abscess requires attention. It does not seem that the presence of albumin has any bearing against its employment, for cases of recovery are recorded where it was present and it is unlikely that the treatment caused it to appear. On the other hand, edema should be regarded as a contraindication because an abscess developing in these circumstances will give rise to considerable tissue destruction on account of its low vitality.

The indications are deduced from the form and gravity of the septic process. The procedure is useless when the infection is confined to the organs of generation, as is also the case when there is a generalized peritonitis. Septicemia, and especially pyemia, are the two processes where good results may be looked for. The time at which resort to fixation abscess should be had is somewhat delicate to decide but is of utmost importance, because success depends upon the early application of the treatment. There are no definite rules to go by and each symptom taken by itself will give no indication. The early onset of the infection, a temperature with great oscillations, the rapidity of the pulse, the dyspnea, repeated chills, and the earthy complexion are all sure signs of gravity, but when they are all present the infection is too far advanced for any treatment to be effective. When proper disinfection of the uterus has been accomplished by modern means and the infectious phenomena persist, it is better practice not to wait too long for a hypothetical improvement. There are, however, certain types of subacute pyemia which can be allowed to run and in these cases a fixation abscess will work wonders. In one instance the treatment was given on the fifty-eighth day after the onset of the infection and two weeks later the patient was discharged well. In another instance the injection was given on the thirty-sixth day and nevertheless recovery was rapid. Therefore, the form of the infectious process must be taken seriously into consideration; if the treatment is undertaken too early it may be a useless interference, but, on the other hand, if it is resorted to too late it will not save the patient. Of the two mistakes it is better to err in being too early in applying the treatment.

It was Fochier's practice to make the injection as near as possible to the focus of infection in order to obtain a revulsive action as well. However, the thigh is the best site for giving it and this appears to be the consensus of opinion. It is readily accessible and the dressings can be easily attended to. The same cannot be said of the flanks because the development of a large abscess over the peritoneum is not without danger and although the pus is ordinarily sterile it occasionally contains endogenous bacteria. Then, too, the connective tissue being very loose here extensive undermining may occur. Is a single injection sufficient? Yes, if the abscess de-

velops well and an amelioration is obtained. In some particularly serious cases it will be more prudent, in order to gain time should reaction be delayed, to repeat the injection at the same spot on the next day or a little later. This has been successful in several instances.

The quantity of turpentine to be injected should not be more than two cubic centimetres; larger doses do not appear to be necessary for the formation of the abscess, while there is every reason to believe that in predisposed subjects, larger quantities of turpentine may cause trouble. The injection should be made in the subcutaneous connective tissue with all aseptic precautions. Incision of the abscess should never be made until convalescence is distinctly established. Once incised its action ceases so that until the patient is well on the road to recovery the pus must be allowed to remain. It is also well to employ collargol or a serum at the same time.

TREATMENT OF PERSISTENT VOMITING OF PREGNANCY.

BY MRS. KELLGREN-CYRIAX, L.R.C.P., EDIN.,
London.

Up to the present none of the methods of treatment of persistent vomiting of pregnancy have been so successful as might have been hoped. I therefore venture to think that it may be of interest to give my experience in connection with the mechanotherapeutics for the condition, as I have by their use attained very good and rapid results in several cases.

The pathology of the vomiting of pregnancy has always been obscure. From time to time various theories as to its cause have been suggested, the chief ones being, a, Toxemia; b, stretching of the nerves of the uterus; c, reflex irritation of the gastric nerves from stimulation of the abdominal sympathetic induced either by expansion of the uterus or a tendency for that organ to sink, or both. Personally I have always inclined toward the latter theory and have been led to this conclusion because: a, The drug treatment of the condition is generally unsuccessful; b, the vomiting usually ceases when the uterus rises above the pelvic brim; c, manipulations directed toward removing the pelvic pressure and irritation have proved efficacious in several cases in which I have employed them.

The actual treatment applied is based upon the late Henrik Kellgren's modification of Ling's system of mechanotherapeutics, and consists for the condition under consideration, of the following manipulations:

1. Lifting of the pelvic organs. The patient should be placed in the semirecumbent position with the knees straight (technically known as the half lying position). To have the patient with the knees drawn up, i. e., in the so-called crook half lying position, is not only unnecessary but is an actual disadvantage, as this causes the pelvic organs to slip back somewhat rendering them more difficult of access through the abdominal wall. The operator, sitting to the right of the patient and holding his right forearm horizontal, places his right hand just

above the symphysis so that the fingers lie in the left iliac region just above Poupart's ligament and the thumb on the corresponding spot on the right side. The fingers should be kept flat, i. e. nearly fully extended in all their joints. Employing the palmar surfaces of the distal phalanges the operator gently works down on either side of the uterus until they have gently closed on it, and then executes small lifting movements applied with simultaneous vibrations (1 to 5); in other words, vibroliftings in an upward direction. These should not be applied continuously but intermittently for about ten seconds at a time followed by a pause of a few seconds—this is repeated during a period of about ten minutes. If the pregnancy is not sufficiently advanced to enable the operator to define the uterus the mere fact of the manipulation mentioned above when applied just above the pubis will make itself felt upon the organ. The immediate effect of the manipulation is that the patient experiences a feeling of wellbeing and relief of the existing tension in the pelvis. Incidentally it also relieves incontinence of urine. As regards the possibility of performing lifting of the uterus *per vaginam*, I have never had recourse to it as I have such good results from the external liftings just described.

2. Stationary manual vibrations applied over the stomach itself, paying special attention to any particularly tender area; they should be administered continuously for the space of about ten minutes. They have the effect of further allaying the gastric irritation that is present.

3. Frictions applied to the posterior cervical, dorsal, lumbar and sacral nerves applied for the space of about half a minute (6 to 10.) These act as a general nerve tonic.

4. If excessive salivation is present I apply gentle vibrations to the parotid and submaxillary glands which usually in a very few minutes markedly reduce the amount of secretion.

The following cases serve as illustrations:

CASE I.—Mrs. A., aged thirty-two. One previous pregnancy with normal termination ten years ago. When I first saw the patient she was in the third month of pregnancy; vomiting had commenced four weeks previously and had been getting progressively worse, so that during the last two weeks she had been vomiting twelve times a day or oftener. After the first application of the treatment she only vomited three times during the course of the day and after the fourth application the vomiting entirely ceased. The treatment was administered on three subsequent days in order to prevent a relapse. Normal partus six months later.

CASE II.—Mrs. B., aged twenty-five; neurotic subject, in the sixth week of her first pregnancy. Vomiting had commenced about a fortnight before and had rapidly increased in severity so that when I first saw the patient she could not even look at food and was quite weak from want of nourishment; she was vomiting eight to ten times a day. The treatment was applied on twelve successive days. After its first application there was no vomiting for two days, then once a day on the third and fourth days, after which there was complete cessation with one exception ten days later, in spite of

the fact that the patient had to work very hard moving into a new house. Normal partus ensued later.

CASE III.—Mrs. C., aged thirty-seven. The patient was a healthy subject; she had had two previous children, seven and five years ago, respectively. During both pregnancies she suffered from vomiting (though not salivation) through their entire duration; it was worse during the first three or four months (vomiting eight times a day), after which it became better (vomiting only twice a day). She had tried all the usual remedies, none of which produced even temporary amelioration. During the third pregnancy, vomiting again set in at an early stage and became progressively worse. When I first saw the patient she was in the thirteenth week of her pregnancy. She had sometimes vomited as much as twenty times a day with simultaneous heartburn during the second and third month; this had improved somewhat, but she still vomited about eight times a day and had continual nausea. Coincident, however, with the improvement in the vomiting, excessive salivation had come on and was so severe that her expectoration filled a three pint jar five times during the course of the day and she was unable to speak even a short sentence without having to expectorate. In consequence she was compelled to partake her meals alone and was unable to see either friends or children. Her general condition was one of great weakness; she was only just able to walk across the room. The first day I saw the patient she had already vomited three times; there was hypersensitiveness in the epigastrium and the submaxillary glands felt hard and shotty. Treatment was applied in all on ten successive days. After the first application there was only one vomit during the ensuing twenty-four hours and there ensued some diminution in the amount of salivation. After the next application vomiting entirely ceased for the next day and salivation rapidly diminished, ceasing first for three and then for six hours at a time; finally, on the eighth day after coming on very slightly before breakfast, it became normal. At the close of the eighth and ninth days, both very fatiguing for the patient, she vomited once. By this time there was a great improvement in the general condition and she was enabled to take walks and traveled home, this entailing a railway journey of several hours' duration. Her general condition during the remainder of the pregnancy was better than during any of the previous ones. A slight amount of vomiting occurred about once a week during the ensuing month and the confinement was normal in every respect.

CASE IV.—Mrs. D., strong, healthy subject under ordinary circumstances. She had had three previous children; during her first pregnancy she vomited the whole of the nine months, during the last two pregnancies four and a half months. All the ordinary remedies had proved quite unsuccessful. When I first saw the patient she was in the second month. She suffered from continual severe nausea and had been vomiting about ten times a day. During the vomiting she strained so much that she broke capillaries in the face and neck on several occa-

sions. She was unable to take any food after tea and often could take nothing after breakfast. She was very weak, had not left her room for six weeks, and had become very emaciated. After the first treatment the patient felt better and there was great diminution of the nausea and she only vomited once during the ensuing twenty-four hours. The next day the improvement was fully maintained and she only vomited slightly once. After the fourth treatment the vomiting was in abeyance for thirty-six hours and the patient felt so well that she went for a short walk. On the fifth day, during which no treatment was applied, she vomited once in the evening; there was no recurrence on the following day. During the seventh day she was able to eat some food in the evening and was not sick though slight nausea ensued. The patient received seven more applications of the treatment; the vomiting did not return, and the sensation of nausea was practically never felt. The patient felt stronger every day. Four months later there had been no recurrence of the vomiting and the patient felt very well.

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PRENATAL CARE FROM THE VIEWPOINT OF THE HOSPITAL.

BY LIDA STEWART-COGILL, M. D., F.A.C.S.,
Philadelphia.

It is estimated by the Children's Bureau at Washington, D. C., that in the United States, sixteen thousand mothers die needlessly each year from childbirth, and two hundred and fifty thousand infants are lost annually in the first week of life.

According to Snow's statistics, based on one hundred million population, there must be two and a half million births annually and half a million abortions, making a loss to our population of three-fourths of a million a year—largely preventable by better obstetrics and prenatal care.

The newborn babe, the most helpless and most precious of all animals, is the most valuable asset to our nation, and yet the medical profession, with all its knowledge of the value of prenatal care, has been silent on the subject or evidenced an indifference which is quite as deplorable and discouraging. But, like the cause of prohibition and suffrage, in due time prenatal care is bound to become a popular topic and a vital issue of the day. I feel,

however, that the credit should be given the pediatricists for bringing this subject to a focus.

It is said that the index to a city's civic pride is determined by the death rate among its babies. Naturally the pediatricists have been interested in finding the cause of the high infant mortality, and after robbing the second summer of its terrors and solving the difficult problem of infant feeding, the rate still being too high, they went still further back until they found themselves in the obstetrician's domain and it became necessary to insist that the high death rate among infants could be lowered if obstetricians would do more prenatal work. They showed by statistics that the majority of babies dying during the first year of life did so before reaching the first month of life, and that seventy-five per cent. of these deaths could be prevented by prenatal care.

A supervisor of nurses in one of the hospitals with which I am connected, who is of German birth and education, remarked to me that she had never seen anything like the American husband. It seemed, as she expressed it, as if he could not do enough for the comfort of his wife; he fairly carried her around on his hands. "We have nothing like that in our country," she said. We American women proudly acknowledge this to be true, that the American man and husband cannot be excelled by any nation. But do you think we are treating him quite fairly—he who is so anxious to have everything done for the best interest of his wife—in keeping him in ignorance of the great value of prenatal care to his wife and child? Or quite fair to that splendid body of workers, composed of a million women, who in two years turned out one hundred million dollars' worth of surgical articles and garments that the soldiers fighting for democracy might have everything necessary for their welfare? For while seventy thousand of these faithful soldiers died in eighteen months of war, there were two hundred and fifty thousand babies under a month who died in one year, and seventy-five per cent. of these deaths were due to preventable diseases.

Of all the Philadelphia soldiers who were engaged in eighteen months of war, only 1,267 were killed or died of wounds, while according to the Division of Vital Statistics for 1918, in this city, 5,366 babies died who were under a year, 4,172 of whom were less than a month old, which means that over four times as many Philadelphia babies under one year of age died in a year (1918) as Philadelphia soldiers engaged in eighteen months of war, showing it to be true that it is more dangerous to be a baby under one year of life than to be a soldier in the front line trench.

According to the Children's Bureau, the United States stands fourteenth on the list of sixteen civilized nations, in its maternal mortality at childbirth, and eleventh on the list in its infant mortality for the first year of life. These statistics must be kept before the public until every citizen is familiar with them and realizes his duty in the matter, until the banker, the broker, and the business man are asking, What is prenatal care, and why does my wife need it? and until newspapers and magazines have properly written articles on the subject. When

American men and women understand that a large percentage of these maternal and infant deaths are preventable, do you think they will allow such frightful wastage of life to go on? Never! I feel sure when they fully understand the need they will work just as hard to see that the mothers and babies receive proper attention and care as they did for those soldiers.

While searching for words with which to express my deep feeling in regard to the necessity of saving those two hundred and fifty thousand children, and sixteen thousand mothers, it seemed to me nothing could be more beautifully expressed than a paragraph in Mr. Roosevelt's article; you are probably all familiar with the article, but permit me to quote this one part: "Alone of human beings the good and wise mother stands on a plane of equal honor with the truest soldier; for she has gladly gone down to the brink of the chasm of darkness to bring back the children in whose hands rests the future of the years." And the nation should by action mark its attitude alike toward the fighter in war and the childbearer in peace and war.

As it is an acknowledged fact that prenatal care is the greatest factor in the lowering of the death rate of mothers and babies, it is up to the medical profession to depart from its policy of silence on this subject, and present a constructive platform for the furtherance of this work, which will:

1. Arouse the community to the need for more prenatal work.
2. Educate the public for the need of supporting institutions doing this work.
3. Arouse the interest and enthusiasm of managers of institutions and agencies doing this work, to the importance of having a budget of sufficient size for a well developed social service department.
4. And which will see to it that every baby enjoys its inherent birthright of being properly born.

There is no better place in which to demonstrate the effect of prenatal care upon maternal and infant mortality and morbidity than in the clinics and wards of a well equipped maternity hospital, where there is every facility for the proper supervision, care and treatment of the pregnant woman, from the earliest months of pregnancy to the end of the puerperium. With a properly equipped clinic, properly kept records and laboratory facilities, and an enthusiastic corps of workers, composed of physician, nurse, social worker and clerk, wonderful results can be secured, but there must be a co-operative spirit—without this, no matter what the equipment or number of workers, little can be accomplished.

Crane states: "It is the team work that counts, not the individual capacity but the linked capacity that makes a group efficient." In the prenatal clinics every patient must be encouraged to register as early in pregnancy as possible, and attend the clinic at stated intervals, the minimum being every month up to the fifth month, every two weeks until the seventh month, and then be seen either at home or in the clinic every week until delivery. All patients showing toxic symptoms or other serious complications of pregnancy, which are not yielding to treatment, must be admitted to the maternity hospital for observation and treatment. Every patient must

have a thorough physical and internal examination. The pelvic measurements must be taken as well as auscultation and palpation of the abdomen. The blood pressure must be taken at each visit, also uranalysis. The Wassermann test must be done for each patient, and as a matter of routine a microscopical examination made of the cervix, vaginal secretions, and Bartholinian glands.

Instructions should be given as to proper food, clothing of self and infant, exercise, hygiene of home, care of nipples, bowels, and avoidance of miscarriage. A card or leaflet should be given to each patient containing instructions as to care of self and child and the significance of certain dangerous symptoms, such as those of toxemia, bloody discharge, and others. The development of the child in proportion to the pelvis must be watched, also cardiac conditions; tuberculous patients must be looked after, and a gradual or sudden rise in blood pressure must put us on guard as to the possible development of a toxic condition. The patients showing a positive Wassermann test must be placed under proper treatment, also those suffering from gonorrhoea. The social worker often has difficulty in having these patients attend the clinics regularly for treatment. It is needless to state the earlier the treatment is started the better the results will be. Without a social worker to carry out follow-up work, little can be accomplished. Properly kept records and the proper kind of records are essential.

There is great need for the intensive study of the mortality from childbearing. The mother must be under complete supervision before labor, after labor, and between pregnancies in order to accomplish this. A study of the last census shows the death rate for 1900 among women of childbearing age to be 50.3 to the 100,000, and this includes a rate of 21.6 for puerperal sepsis alone, which is a preventable condition. The hospital should carry on a detailed study of the effect of venereal diseases upon mother and child.

There will be little decrease in the mortality from childbirth until the standard of obstetrics is raised to its proper place, where it will rank with major surgery. The public should recognize the necessity for skilled attention for every pregnant woman. Upon discharge from the maternity hospital, the mother and baby should be referred to a health clinic, where they should report at stated intervals for observation and care. Keeping the mother well between pregnancies is a most essential factor in reducing the mortality and morbidity of mother and baby. There should be a prematernity department, distinct from the maternity hospital, for the pregnant woman who needs rest and good food before confinement, and for those who have had complications in former labors and for those whose condition make it necessary for them to be kept under observation and treatment.

The Babies' Welfare Association seems to be the only organization which is endeavoring to put on record the amount and character of the prenatal work being done by institutions and agencies in Philadelphia. There are thirty-two of these organizations, all members of the Babies' Welfare Association, and forming five distinct types, namely:

1, Division of child hygiene; 2, visiting nurse society; 3, dispensary with its own maternity; 4, dispensary without maternity, and 5, health centres. In order to obtain these data a questionnaire is sent each year to these different organizations, the results are compiled, and a copy sent to the Children's Bureau at Washington, D. C., and the American Child Hygiene Association, for their files. The obtaining of these data is attended with considerable difficulty, and we are indebted to the untiring efforts of our assistant secretary that so much has been accomplished.

At the suggestion of one of the social workers, a monthly record sheet has been printed by the Babies' Welfare Association to be used by the different organizations in order to facilitate this work. This sheet contains all the questions asked on the questionnaire and seems to be giving satisfaction. Twenty of the organizations are using them at the present time, so that statistics are more readily obtained. The main handicap in securing data seems to be due to the poorly developed Social Service Department. The governing bodies, either not realizing the great necessity for such a department or being unable to provide funds for the proper carrying out of this work. Only twenty of the thirty-two organizations sent in their questionnaires this year, but each year shows more co-operation. We are unable to give the number of babies living and breast fed, one month after birth, due to lack of followup work. Only five of the twenty organizations are taking routine Wassermann tests and making microscopical examinations of the vaginal secretions, and only fifteen are taking the blood pressure of the patients as a matter of routine, and yet all obstetricians realize the great importance of these tests.

Before these institutions realized what the Babies' Welfare Association was trying to accomplish, the questionnaire was received by them with varying degrees of cordiality. This was due, I feel, to the following reasons: 1. The organizations which were rather indifferent toward prenatal work considered it a bore. 2. The organization which was interested and anxious to do good work, but were prevented either by lack of funds or the proper kind of workers. 3. Those workers who had properly kept records in a well organized social service department were pleased to show the kind of work they were doing.

Do we not owe it to that little atom of humanity, starting on a life more hazardous than that of a soldier in the front line trench, to put into effect these measures which are known to remove seventy-five per cent of its perils?

1831 CHESTNUT STREET.

Röntgen Ray Studies of the Bronchial Function.—Jesse G. M. Bullova and Charles Gottlieb (*American Journal of the Medical Sciences*, July, 1920) have observed a bellows like action in the trachea and bronchi which may be limited by contraction of the bronchial muscles, and a peristaltic action of the bronchial muscles which seems adequate to empty them without invoking ciliary movement.

THE IMPORTANCE OF PRENATAL CARE.

BY MOSES LOBSENZ, M. D.,

New York,

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In modern medical progress, particularly in relation to definite diagnosis and treatment, the tendency has been toward group diagnosis. Why, then, should not a gravid woman receive the benefit of this advance? Prenatal care in clinics and among general practitioners is treated with the presumption that pregnancy is a physiological process, able to take care and dispose of itself. At some clinics Wassermann tests are taken. These clinics pride themselves justly with doing a great deal for the woman if the Wassermann happens to be positive and they inaugurate the proper treatment. This is truly a great advance and of great assistance to the woman, the coming fetus, and the community. But the amount of syphilis found by the Wassermann reaction depends entirely upon the locality of the clinic, hospital, or types of patient the physician encounters. We know that in the colored race syphilis is far more prevalent than in the white race and, therefore, when we study statistics we must weigh them by their locality. The blood pressure of the patients is taken; if taken carefully, it is of assistance in corroborating other findings, such as nephritis. Urinalyses are performed, but in most clinics and by most physicians, single specimens are examined. This is erroneous and leads to nothing. A twenty-four hour specimen should be required and a careful examination made, particularly as to specific gravity, amount excreted, albumin, urea, acetone and acetic acid; and a microscopical report of casts, blood, and pus.

Measurements of pelvis are taken. These naturally help us find gross abnormalities. Measurements, even when taken by the most expert, are erroneous, due to the impossibility of measuring accurately the internal strait and the fetus. We have all had the experience of making a diagnosis of a contracted pelvis and preparing the patient for a Cæsarean section only to have labor terminate in a perfectly normal delivery. Similarly a diagnosis of an ample pelvis may be made, only to have to resort to Cæsarean section after an attempt at labor. Therefore a certain number of mishaps to mother and fetus will always occur from this cause. There will always remain a certain number of fatal results from placenta prævia and accidental hemorrhage, eclampsia and nephritic convulsions. Aside from the patients lost from these causes, there are a marked proportion lost from infection of unknown origin. A great many miscarriages and abortions, breast abscesses, pyelitis, and perhaps even cases of placenta prævia and accidental hemorrhage are due to unknown causes. What should be done to give more information in these cases? What are the different channels by which infection may travel?

It is readily seen that, due to engorgement, the uterus would be a favorable seat for almost any focal infection through venous, lymphatic, or arterial channels. It is therefore essential that all possible focal areas of infection should be elim-

inated. First in importance are the teeth. The services of a dentist with the proper x ray facilities are necessary to the obstetrician. He should correct all cases of pyorrhea, and see that all abscess cavities are properly drained. The late Dr. Joseph Bryant always impressed it upon students that wherever pockets of pus were found, immediate drainage should be carried out for fear that these foci would lead to ultimate infection of some other organ. It is known that abscessed teeth and pyorrhea are the cause of rheumatism and joint infections, as well as disorders of the organs of the chest and abdomen. What is to prevent the bacteria from these abscesses finding lodgment in the uterus? Like the spirochete in syphilis, cannot these same bacteria lodge themselves in the placenta and be the cause of some of our cases of miscarriage, abortion, placenta prævia, and accidental hemorrhage? Can they not also be the cause of some of the breast abscess and pyelitis cases of unknown origin? It would be foolish to enumerate cases of this type, for everyone doing obstetrical work has encountered them.

Next in importance is the nose and throat specialist, who should carefully examine the patient. He should treat any infection from the tonsils or sinuses. The lung specialist should note any areas of tuberculosis. If such an area is found, the patient should be kept under close observation and the obstetrician advised. It is known that tuberculosis advances with pregnancy; a patient of this type in the proper environment and under close scrutiny could perhaps continue in her pregnancy and give birth to her child, the obstetrician being advised however if interference is necessary.

The heart specialist should examine and treat all cases of heart murmur. Cardiogram tracings should be taken as well as the blood pressure. In this way instead of the casual taking of blood pressure it would be taken by a man interested in that particular field in conjunction with his other examinations, and would prove of great value to us. Examinations of blood, urine, sputum and feces by a man skilled and interested in this work, would bear great weight in the ultimate treatment of a patient. A social service organization with properly trained nurses, to look after and correct faulty surroundings and hygiene and to see that patients report back as requested, would be excellent. It would be the duty of these nurses to inform the obstetrician of a previous miscarriage, abortion, or dead fetus, and the cause of the accident, if found. In case of syphilis the nurse should follow up patient after discharge (postpartum) and see that another Wassermann is taken subsequently and if positive treatment be continued. The husband of such a patient should have a Wassermann taken and if positive should be properly treated. The obstetrician would then be called upon to pay attention only to his particular field and with all other data on hand would be fit to treat the patient correctly, conscientiously and conservatively.

CONCLUSION.

In order to give the gravid woman proper care, therefore, the following routine ought to be arranged: 1. History taking room for taking careful

and detailed histories; 2, dentist with proper x ray facilities; 3, nose and throat laboratory with proper facilities; 4, lung examination; 5, heart examination; 6, laboratory; 7, social service, and 8, obstetrical care.

This routine, although cumbersome at the start, I am sure could readily be arranged and would do away with much of our maternal and fetal mortality, for the obstetrician who has access to accurate data furnished by physicians interested in their particular fields could pay proper attention to his one duty, namely, the passenger and its passage.

233 WEST 122ND STREET.

THE EARLY DIAGNOSIS OF PREGNANCY.

BY DAVID LAZARUS, M. D.,

New York.

Normally every girl at or about the age of fourteen begins to show signs of a bloody discharge from the vagina, known as menstruation. This process occurs with a regularity of from twenty-four to twenty-eight days, except during pregnancy, lactation, and often in tuberculosis, severe anemia, exposure to sudden cold, weather changes or changes of climate, as is noted in girls emigrating from foreign countries to this land. Should the period not occur, and should there be a clear history of sexual intercourse, with or without the penetration of the penis into the vagina, the absence of menstruation may be regarded as the first sign of pregnancy. Often, however, the sexual act or the coaptation of the penis to or with the vagina is denied, and it is in these cases that other and more reliable signs than amenorrhea must be sought. These signs can be classified as subjective and objective signs and symptoms.

Subjective symptoms.—Sensation in the breasts in that they are feeling heavy, distended and heated; it is also noted that they are beginning to enlarge; feeling ill or nauseated every morning on arising, although not actually vomiting; the abdomen is distending and getting larger and fuller; dark rings are noticed under the eyes; there is a longing for foods never or very seldom desired before; the desire for sexual intercourse is stimulated almost to excess.

Objective signs.—These are best divided into external and internal signs.

The external signs are manifested in a rather selfconsciousness of expression of the patient, in that she imagines all are looking at her and that her condition or state of pregnancy is visible; enlargement of the breasts with an increase of the pigmentation area about the nipple, and the presence of enlarged or radiating veins; colostrum may be squeezed from the nipple, or in the very early days of pregnancy only a few drops of a clear liquid may be expressed from the nipple; enlargement of the abdomen consistent with the period of gestation; a dark line beginning to form in the midline of the body extending from the pubis to the umbilicus; enlarged veins about the vagina, causing the well known classical purplish discoloration.

The internal signs of pregnancy are indeed the

more reliable especially in those cases where sexual relationship has been denied. These signs are ascertainable by a vaginal examination with or without an accompanying abdominal palpation:

A feeling of warmth in the vagina as the hand is introduced therein; an enlarged uterus, assuming a pear shaped outline and uniform softness; softening of a small area in the junction of the cervix with the body of the uterus, known as the Ladinski sign (1), as early as the third week of pregnancy. This in reality is the beginning of the softening of the entire cervix, which in the later weeks of gestation becomes known as the Hegar sign. However, it is a reliable sign and should always be sought for in the examination for pregnancy. Ballotment is perceived in later pregnancy and depends upon the development of the fetus; fetal heart signs are audible at about the fifth month and is the undeniable symptom of pregnancy, as is also the sensation of quickening.

Aside from the symptoms and signs mentioned, one may arrive at a fair diagnosis of pregnancy by the serum test of Abderhalden (2), which manifests the presence of placental tissue as early as the fifth week; this examination of the blood taken in conjunction with some of the signs and symptoms quoted above certainly diagnose pregnancy. The microscopic examination of the urine reveals the presence of endogenous new formations in the cells and is a valuable aid in making a diagnosis.

Recapitulating, the early signs of pregnancy are: amenorrhea, morning sickness, perversion of appetite, enlarged breasts, enlarged abdomen, discoloration of the vagina, enlarged uterus, Ladinski sign, Abderhalden test, urine examination.

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327 CENTRAL PARK WEST.

THE DIAGNOSIS OF PREGNANCY.

BY MANLY B. ROOT, M. D.,
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Pregnancy, usually correctly diagnosed by the woman herself, demands considerable obstetrical skill for its positive recognition. The numerous mistakes that have been made justify a careful consideration of the subject. In a short article we must presuppose a knowledge of the various symptoms and signs and attempt merely to discuss their relative values. We are discussing a positive diagnosis. Presumptive symptoms and signs have therefore no interest for us except that their absence often makes us hesitate to diagnose pregnancy.

An absolutely positive diagnosis can not, it is true, be made before the eighteenth or twentieth week. But to one thoroughly familiar with the size, shape, consistency and relations of normal and pregnant uteri, bimanual examination reveals the presence of signs dependent on uterine changes which make

possible in a normal uncomplicated case a practically certain diagnosis from the second to the fourth month. The lower uterine segment fills out first, changing the shape of the uterus from pyriform to jugshaped, the body becoming spherical. This allows the latter to be felt by vagina more easily than that of a nonpregnant uterus. Moreover it results in an apparently well marked shortening of the cervix so that the examining finger has less room in the anterior and posterior vaginal fornices. Careful palpation gives us von Fernwald's sign: the antero-posterior thickening of the uterus is more marked on the side containing the ovum, if it is located on one side.

The gravid uterus always undergoes a softening which commences about the fifth week as a soft fluctuating area on the anterior wall just above the cervix. The recognition of this is known as Ladinski's sign. This softening soon extends throughout the uterus and by the tenth week we can get Hegar's sign: with fingers of one hand in the posterior fornix and of the other on the abdominal wall, these fingers can be nearly approximated due to the giving away of the softened uterine body. The steady, rapid growth of the uterus at this period is very significant, no tumor increasing as rapidly in size.

When all or nearly all of these signs are present a tentative diagnosis can be made. It is verified, of course, by the early presumptive symptoms: amenorrhea, morning nausea and vomiting, salivation, vesical irritability, and nervous phenomena; and by the presumptive signs: pigmentation, breast changes, purple color of vulvar and vaginal mucosa (Chadwick's sign), and softening of the cervix.

After the eighteenth or twentieth week a diagnosis can be made which cannot be questioned. This is dependent on three signs: 1. Hearing the fetal heart, a sound resembling that made by a watch ticking beneath a pillow, with a rate of 120-160 a minute and not synchronous with the mother's pulse; 2. Feeling the fetal movements, active and passive; the former as transmitted to the hand of the examiner through the abdominal wall. The movements felt by the woman are of little value. The passive movement may be obtained as abdominal ballotment between the fourth and seventh months. With one or two fingers in the anterior vaginal fornix if a tap is imparted upward to the fetus the latter strikes the anterior abdominal wall and returns to the fingers. 3. Ability to map out the parts of the fetus. Any of these three signs make a positive diagnosis, but as a verification the earlier symptoms and signs should still be present.

A word must be said about the differential diagnosis. Pregnancy is most often simulated by subinvolution, chronic metritis, myomata, ovarian cysts, fatty enlargement of the abdomen, and ascites. A careful physical examination resulting in determining the presence or absence of the symptoms and signs described above usually make the diagnosis clear as far as pregnancy is concerned. Here especially the absence of the early presumptive symptoms and signs of pregnancy is of aid in preventing a false diagnosis, although the final decision is dependent on the results of bimanual examination.

121 GREENE STREET.

ILEOCECAL TUBERCULOSIS.*

BY ABRAHAM O. WILENSKY, M. D., F. A. C. S.,
New York.

The cases which I shall describe illustrate exceptionally well some of the manifestations under which tuberculous affections make their appearance in the ileocecal region. The group in which these cases fall is a very large one and is, perhaps, most noted for the frequency with which its acute phenomena mimic other surgical emergencies in the right iliac fossa and for the difficulties in differential diagnosis.

CASE I.—A young man of eighteen years was admitted to the hospital with the clinical picture of an acute perforating lesion of the appendix. His family and previous history had no essential bearing on the present condition and, in fact, this was the first illness the patient had ever had. The illness began on the previous day, was ushered in with severe generalized abdominal cramps and was associated with vomiting and with an inability to move the bowels. Within a few hours after the onset the pain localized to the right iliac fossa and fever appeared. Thereafter the symptoms progressed so that at the time of admission to the hospital they were well marked. The physical examination disclosed generalized abdominal rigidity, most marked on the right side with tenderness limited to the right iliac fossa where a small mass was palpable. The examination of the rest of the patient's body disclosed nothing abnormal.

There seemed to be no doubt about the diagnosis of an acute appendicitis and the patient was immediately subjected to an operation. On opening the abdomen a large inflammatory mass was seen to occupy the right iliac fossa, involving the angle of junction of the ileum and ascending colon. On unravelling the mass it was found that a much thickened, inflamed, gangrenous and perforated appendix passed upward from its usual point of origin in the ileocecal junction to the left and inward toward the median line; partly it, and partly the adjacent coils of ileum and ascending colon formed the dense walls of a small abscess containing about an ounce of grayish white pus. The abscess had burrowed through the mesentery; the abscess cavity lay partly to the right and partly to the left of the corresponding leaf of the mesentery; and the tip of the appendix projected through the resulting communicating opening. As far as one could see there were no other evidences of further disease in the operative field. As a matter of fact, the condition resembled in every particular that seen with the ordinary forms of suppurative appendicitis. The appendix, therefore, was removed, the abscess cavity was cleansed, and, the appropriate drainage having been adequately provided, the abdominal incision was closed with the exception of that part from which the drainage emerged. It was expected that the usual postoperative course would follow and that healing would result in the ordinary manner.

Much to our surprise and chagrin a fecal fistula developed at the end of the first week. The dis-

charge was never profuse and the fecal discharge ceased within a short time. Then the sinus contracted to a narrow deep channel from which an insignificant amount of purulent discharge escaped each day. Every opportunity was afforded for the closure of the wound but at the end of the fourth month practically no progress was made and it became apparent that a secondary operation would be necessary to insure healing.

At the second operation the cause for the persistent sinus became apparent immediately. The sinus led down to a pinpoint perforation in the beginning of the ascending colon; from the latter and extending on both sides but much more in an upward direction, a segment of colon was demarcated by an extraordinary rigidity and thickening of its walls on the peritoneal surface of which a profuse crop of small miliary tubercles testified to the tuberculous nature of the process. No other lesion being found, the terminal portion of the ileum and the caput and ascending colon as far as the hepatic flexure were excised and the continuity of the intestine was reestablished by a side to side suture anastomosis. No drainage was employed and the abdominal wound was closed. An uneventful convalescence followed and at the end of the second week the patient was discharged from the hospital.

In this case an examination of the specimen showed that the entire lesion was in the ascending colon and was of the peritoneal variety. The mucous membrane showed no ulcerations. The thickened wall of the colon encroached somewhat on the lumen of the bowel but no actual stenosis was present and a finger passed easily upward and downward through the compromised area.

CASE II.—The second patient was a young girl aged sixteen years, who, similarly to the previous patient, was admitted to the hospital with what was thought to be an acute appendicitis. The history was quite the orthodox one for such an illness and included an acute onset with generalized abdominal pain associated with vomiting and constipation, followed by a fairly rapid subsidence of the general symptoms concomitantly with the localization and intensification of the symptoms—pain, rigidity and tenderness—in the right iliac fossa. There was nothing in the family or previous history to cause one to suspect an unusual etiology. This patient, too, had never been ill before. The general physical examination disclosed no abnormal findings and locally a small mass was palpable which was interpreted as being a much thickened appendix or an abscess derived therefrom.

Operation was done immediately. On opening the abdomen, however, it was found that the small mass was a group of inflamed glands buried in the mesentery near the ileocecal junction. These were matted together and contained a soft area. The appendix, although it lay close by, was not involved in the process. Nowhere else in the belly could any other lesion be demonstrated and in the immediate neighborhood there was no indication of a spread of the pathological process either from, or to, the intestinal tract. The appendix was removed. An attempt was also made to enucleate

* From the Mount Sinai Hospital.

the glands but, owing to the very nature of the process, this was only partially successful. During the manipulations the abscess ruptured and discharged a small quantity of yellowish pus. Finally, a drain was inserted and the abdominal wound was partially sutured.

A fecal discharge appeared in the second week. This was rather profuse and continued for more than four months unchanged. The sutured part of the abdominal wound, having become infected during the operation, parted later and thereafter the healing proceeded slowly for a number of months until nothing was left but an extremely narrow fistula through which fecal material continued to discharge. The sinus showed no tendency to close. Again exhausted patience prompted the secondary operation. Examination of the lymph nodes, excised during the operation, demonstrated that the process was tuberculous so that, when the sinus developed, became persistent and refused to heal, we were quite cognizant of the underlying cause which prevented the healing. Examination of the rest of the patient's body failed to reveal any other focus of tuberculosis, and, when the secondary operation was determined upon, one felt confident that the success of the procedure, which would prove necessary to ensure closure of the fecal fistula, would not be ultimately jeopardized, or rendered futile, by the flaring up of any pulmonary, or other, focus. To revert to the patient's history:

The abdomen was again opened. Conditions similar to those in the first patient were found. The lesion was partly in the ascending colon and to a slight extent in the terminal ileum. The sinus lead down to a pinpoint opening in the bowel. The wall of the latter was thickened and rigid without, however, having any tubercles visible on its exposed surface; but the general appearances of the gross pathology indicated the tuberculous nature of the infection, even if we had had no previous evidence in the microscopical examination of the lymph nodes. No other lesion being demonstrable in the adjoining coils of gut, the involved ileocecal junction was excised and the continuity of the alimentary canal reestablished by a side-to-side suture anastomosis. Drainage in this patient, too, was omitted and the abdominal wound was closed. The convalescence was again most uneventful and at the end of the fourteenth day the patient left the hospital cured.

The excised specimen differed from the previous one in having the bulk of the lesion on the mucosa side. Here there were a number of large and small ulcerations with overhanging edges and showing a tendency to have their longest diameter in the transverse direction. There was no stenosis of the lumen even at the ileocecal valve. The walls of the bowel showed a marked thickening.

The dominating fact evidenced by these notes is the striking similarity of the initial clinical pictures with that of the ordinary forms of acute nonsuppurative and suppurative appendicitis. This similarity is not peculiar to tuberculous lesions and I have seen similar marked resemblances in the clinical course of other pathological lesions such as carcinoma, lymphosarcoma, or surgical forms of productive colitis of limited extent, all located in

the right lower quadrant of the abdomen. The coincidence may have one of two explanations: In the one case the pathological condition involves the appendix directly and there are a fair number of cases on record in which the tuberculous (or other) lesion is readily demonstrable in the appendix. In the other case, the lesion originally involves an adjacent portion of either the colon or the small intestine; the appendix is subsequently affected either as an entirely new process in which the pathological condition is that of the ordinary forms of appendicitis, or the inflammation is directly due to the extension of the original disease, or is aided by mechanical disabilities produced by the latter leading to stricture and obstruction of the appendix lumen.

The literature of the past few years contains numerous allusions to the difficulties in the differential diagnosis of conditions in the right iliac fossa. All of these enhance the importance of constantly keeping in mind the various forms of disease in the latter region which can be masked under similar subjective and objective symptomatologies. Besides disease of the appendix itself and the neighboring parts of the small and large intestine, these include affections of the omentum, of the mesentery or its contained lymph nodes, of the appropriate part of the genitourinary tract, and of the cellular tissue of the retroperitoneal space, all of these comprising both inflammatory and neoplastic lesions. In a general way the symptomatologies of all of these are not peculiar to any particular one and only indicate the location of the body in which the lesion is to be found. The differentiation must be made upon conclusive local evidence such as is produced by the aid of the cystoscope, upon the conclusive or relative evidence of the röntgen ray, or it is based upon the accumulated experience of the individual observer and is then largely determined by the relative frequency of occurrence of the various forms of disease and is limited by the frailty of the human equation.

In the more chronic forms of disease the difficulties are not nearly so marked and with sufficient care in the taking of histories and in examining the patients the diagnosis should be made and comparatively few errors should occur. In the acute cases the differential diagnosis is sometimes extremely difficult and often accuracy is not possible until the lesion is exposed during the operation. Fortunately, in the majority of such patients the indications are the same and, when it is found that the appendix is involved in a suppurative process, a suspicion that underlying it is a more important lesion, such as a tuberculosis or carcinoma, would not detract from the necessity of reserving for a secondary operation the more extensive resection which would be necessary.

In children the difficulties in the acute cases are multiplied by certain possible, and unavoidable, inaccuracies in the histories, and by the patient's lack of cooperation when the physical examinations are being made. I have in mind a certain group occurring, in my experience, in young children in which the history is always that of a typical attack of acute appendicitis. The physical findings are of

sufficient intensity to demand an emergency exploration; then one is astonished to find that the appendix shows practically no abnormal change, but that the glands of the mesentery show a uniform discrete enlargement. Usually the appendix is removed and one of the glands is excised for microscopical examination. The postoperative course thereafter includes an immediate drop in the temperature and an improvement in the local and general symptoms that is progressive and permanent.

Such adenopathies are rather frequent in the angle of junction of the small and large bowel. Not always is the microscopical picture that of a tuberculous infection and the assumption seems not unreasonable that the adenitis is the reply to some bacterial or other trauma derived from the appropriate part of the alimentary tract. More advanced cases include those in which the glands become matted together, or undergo suppuration and in many of these the infection is demonstrably of a tuberculous nature. There seems to be marked resemblances between these forms of mesenteric adenitis and those occurring in the neck. The second case described belongs in this group.

Very frequently, whether the essential lesion is in the appendix or bowel, or whether it is in the mesenteric nodes, the character of the pathological condition is such as to demand the institution of drainage. This was so in both of the cases described. The occurrence of the fecal fistula in both of the patients seems to be a very common complication of the postoperative period in cases of this kind; in some the wound discharges are profuse, in the others they are not. In all of them the sinus persists for long periods of time and either heals after the lapse of many months, or shows no tendency at all to close. The obstinacy displayed in healing is due to the presence of the communication with the interior of the bowel. In the cases in which the appendix has been ablated the line of closure of the appendix stump, whether it be treated by simple ligation and cauterization as in our cases, or whether the stump is further buried, is rendered rather insecure because of the tuberculous nature of the accompanying lesion and the intestinal fistula is directly attributable to the latter. In extraintestinal lesions the sinus can be due to the extension of the pathological process; or the removal of the gland, or glands, is accompanied by some compromise of the blood supply large enough to result in a local area of necrosis in the bowel wall. I think that all of these mechanisms played a part at some time or other in the pathological findings of the cases described.

In any given case it is not at all simple to decide accurately prior to the second operation as to the nature of the impediment which persists in keeping the sinus open. This is all the more so inasmuch as in certain of the ordinary forms of appendicitis in which drainage is instituted, sinuses persist and are due to mechanical causes, to a reopening of the appendix stump, or to the retention of foreign bodies. In the first of the cases reported the actual nature of the lesion was not suspected and when the sinus refused to heal it was feared that some foreign body had been accidentally retained.

In neither of the two cases did I make use of the röntgen ray as a help towards elucidating the nature of the obstacle which was impeding the healing. In the one case the microscopic examination of one of the excised glands had demonstrated conclusively the tuberculous nature of the affection; in the other it was feared that some foreign body—a piece of rubber tubing or gauze—was present in the wound; in either case it was thought that the x ray would throw no additional light which would be of sufficient value. In uncomplicated cases in which no previous operation had preceded, the x ray is undoubtedly of great help for more than one reason. A röntgenographic picture showing hypermotility and spasm, or filling defects in a patient with pulmonary tuberculosis, should lead to a definite diagnosis of colonic tuberculosis. In moderately early cases certain radiographic shadows cast by the barium meal at the end of six, eighteen or twenty-four hours, determine definitely to the trained radiologist the presence of colonic ulcerations; their absence does not, however, exclude their presence. In the presence of a wound the picture would undoubtedly suffer much distortion owing to the abnormalities which could conceivably result from the operative interference, and the assuredness with which the röntgenographic picture would be interpreted would suffer much deterioration. There would be little need for the x ray to demonstrate the exact point of entry of the sinus into the bowel, inasmuch as such information would be available with sufficient accuracy for practical purposes from the findings of the primary operation.

I am not in favor of any of the temporizing measures or local plastic operations for the closure of these sinuses. With cases of this kind the fistula is very deep and the mucous surface of bowel with which the latter becomes continuous is at quite a distance from the skin. Mechanically, conditions are most favorable for spontaneous closure and, when for one or another reason there is a refusal to heal, a complete exposure of the parts is imperative in order to accurately disclose the offending pathological process.

My usual practice is to close the sinus opening with a running suture after creating by dissection appropriate skin flaps on either side. Then the surface is again sterilized with tincture of iodine and, with clean instruments, the abdomen is entered in the free portion of its peritoneal cavity either above or below the previous operative field and directly in its line. That portion of the intestinal tract to which the sinus leads, as well as the entire surrounding mass of adjacent and adherent coils of intestine and omentum, together with the sinus containing scar in the skin and abdominal wall, can now easily be circumscribed in the dissection until the whole can be freely delivered without the body cavity. The pathological condition is then apparent, the extent of the lesion can be accurately delimited, and, if necessary, any further exploration can be done in complete safety. The risks of infection with this technic are at a minimum and are not any greater, in my experience, than with any other laparotomy; so much is this so, that I do not hesitate at the conclusion of the operation to omit any

form of intraabdominal drainage and to close the abdominal wound in its entirety.

With the parts adequately exposed it is essential to make sure that the lesion is one whose extent is limited within the boundaries of operative removal, and that there are no other similar lesions at some distance away which would nullify the success of the operation. This is absolutely so in any uncomplicated case in which the operative exploration demonstrates a tuberculous lesion; and when the latter is too extensive, or is spread about in multiple fashion, the attempt to do anything of a radical nature must necessarily be abandoned. In the presence of a sinus, however, as in both of the reported cases, an added indication exists, the urgency of which would impel one to resort to some method competent to result in closure of the fistula even when the operation would not remove the entire lesion. There should be no hesitancy in doing so with tuberculous lesions inasmuch as nature frequently helps materially and succeeds in completing the cure when the tissues are primarily aided by the removal of the major focus; this experience is quite common with tuberculous lesions elsewhere.

The procedure of choice in my experience is a clean resection of the ileocecal junction extending well into healthy portions on either side. Especially with tuberculous conditions it seems much the safest way to close completely the stumps of the bowel and to reestablish the continuity of the intestine by side to side suture anastomoses. A great deal of valuable time can be saved by closing the open end of the large bowel and by anastomosing the stump of the small bowel into the side of the colon very near the line of section and closure. With both of these two methods additional time can be saved by making the anastomosis with a Murphy button. I have operated according to all of these methods and have had almost equal satisfaction with all. In one of the button cases a leak developed and the sinus persisted for several months; drainage had been employed and contributed materially towards this complication. In subsequent cases the opportunity for this complication was so minimized by the avoidance of any drainage that it did not occur. I prefer the second of the two methods outlined (with or without the aid of a Murphy button), both because of the time saving factor and because of the close approach of the resulting anatomical relationship to the normal morphology.

With good technic the operative field is not contaminated and the abdominal wound can be closed entirely. It is not necessary and it is a distinct disadvantage to drain in any of these cases; drainage is frequently a broad invitation for trouble. The presence of a tuberculous lesion furnishes an additional and powerful factor for the avoidance of any drainage.

Intestinal tuberculosis is a very common condition, more frequently than not associated with pulmonary foci. When, however, limited to the ileocecal region the tuberculous lesion is quite commonly independent of any other focus in the body and, as a primary condition, forms the portal of entry of the infection. Advanced forms of either

disease can be recognized with the clinical means at our command with a fair degree of certainty. The early and latent cases are not so susceptible of recognition; have few, if any, symptoms; are not accompanied by a perceptible cachexia, and frequently make their initial appearances under the acute and urgent circumstances of an acute appendicitis in the pathological condition of which the true nature of the lesion is successfully camouflaged. This local form of tuberculosis lends itself very readily and efficiently to surgical treatment and gives promise of affording a complete cure when the condition is properly handled.

1200 MADISON AVENUE.

Surgical Aspect of Dysentery.—Z. Cope (*Lancet*, March 13, 1920) gives the results of his experience in Mesopotamia, together with a review of the literature regarding this subject. Dysentery may develop in the course of the surgical treatment of almost any condition as a lighting up of an old process by the preliminary purgation or as a terminal event in a long drawn out surgical condition. It may simulate carcinoma of the gut or almost any of the acute surgical conditions of the abdomen. But of chief interest to the surgeon are the complications of dysentery due to local processes set up by the inflammatory reactions in various parts of the organism. These are:

1. Perforation of the gut, comparatively rare in occurrence, most common in the cecum and sigmoid. When the perforation is into the peritoneal cavity the treatment is rendered difficult by the debilitated state of the patient and by the fact that the intestinal wall of dysentery is extremely friable about the site of the perforation. Suture is rarely successful and patients occasionally recover without interference. Abscesses due to retroperitoneal rupture of the wall respond well to incision and drainage.
2. Acute edematous localized colitis produces symptoms so similar to those of appendicitis that this must be constantly kept in mind. The condition at this point in the intestinal tract does not give rise to the more urgent symptoms of dysentery, so careful stool examinations are necessary.
3. Dysenteric appendicitis occurs occasionally.
4. Extensive sloughing with the formation of large secondarily infected ulcerating areas which fail to respond to emetine requires appendicostomy or valvular cecostomy with systematic irrigations of the large intestine. If this fails to heal the ulceration, open cecostomy or enterostomy with complete division of the small gut to give the colon a complete rest for some weeks should be performed.
5. Cicatrization is exceedingly rare, probably because the cases with ulceration and inflammation enough to produce large cicatrices are so commonly fatal.
6. In eleven cases of perinephritic abscess not due to gross disease of the kidney, the writer found four with a history of previous dysentery or diarrhea and in two of these, amebæ were found in the stool.

The more remote complications, amebic hepatitis, abscess of the liver, brain and spleen, and cystopyelitis, are, aside from the hepatitis and liver abscess, rare in occurrence. They must be treated with emetine as well as surgically

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INTRALIGAMENTOUS UTERINE FIBROMYOMATA.

Myomata of the uterus found in the folds of the broad ligament represent a special variety of these neoplasms. They merit a special study by themselves both because of their peculiar clinical character and the somewhat special conduct to be followed in their treatment. These growths are characterized by their implantation on the sides of the uterus, in the body of the organ and more especially the cervix. In order to understand the evolution of intraligamentous myomata the shape, direction and exact site of the broad ligaments, their relationship to all the pelvic viscera—bladder, ureter, intestine, rectum, vessels and nerves—must be clearly understood. The two layers of the broad ligament are separated by a cellular layer—the so-called umbilico-pelvic aponeurosis of Petit—which lines each broad ligament and separates their two folds. These neoplasms are variable in size, sometimes single, at other times multiple, of hard or soft consistency, and always develop in a transversal direction. Like other uterine fibromyomata the intraligamentous variety may undergo malignant changes, and septic processes may occur. Separating the two folds of the broad ligament they may likewise dissect off the mesodermic layer or even decorticate the parietal peritoneum to some extent. The bladder, ureter, rectum, vessels and nerves of the pelvis are often deformed, flattened or changed in their anatomical relationships.

The cause of intraligamentous development of uterine fibromyomata is not clear; their frequency as compared with other similar uterine neoplasms is about one to ten. The symptoms to which they give rise are above all disturbances resulting from compression, while the functional disturbances that constitute the uterine syndrome are usually mild in these cases. The physical signs are otherwise important. The tumor is fibrous in consistency, with a transversal development, slightly movable, connected with the uterus and projecting into one of the vaginal culs-de-sac. The diagnosis is not always an easy matter and can be made by combined abdominal and vaginal palpation. When the growth has a pelvic development the differential diagnosis must be made between hematocele or perhaps inflammation of the adnexa and, when abdomino-pelvic, between tumors of the iliac bones, ovary, or broad ligament and pregnancy.

The prognosis is somewhat serious. When once developed the compression disturbances do not retrogress and more than any other type of fibromyomata those comprised within the broad ligaments disturb pregnancy and interfere with labor. Operation is indicated when the onset of disturbances from compression is detected. Myomectomy should only be employed when the growth is single and connected with the uterus by a thin pedicle, otherwise hysterectomy should be done. If the growth is of medium size and inserted at the upper part of the side of the uterus, supravaginal hysterectomy will suffice, but it should be total when the neoplasm is inserted in the cervix or is large. Should decortication of the tumor prove to be laborious, with rupture of numerous adhesions, not only should careful abdominal drainage be carried out but it is better not to suture the vagina. When the case is complicated by pregnancy and surgical intervention is necessary, myomectomy should be done, if gestation is in the early months, and if toward the end, hysterectomy or Porro's operation. The induction of premature labor should invariably be proscribed.

THE FUTURE OF HOSPITALS.

The trend of the practice of medicine appears to be in many respects changing, that is to say, it seems that the medicine of the future will be more of a preventive character than formerly. If this be so then the hospital system will require a certain amount of revision. Students must be trained as

thoroughly in diagnosing early symptoms of disease and in the best ways of preventing them from becoming serious, as in treating diseases when they have obtained a foothold. This is preventive medicine as expounded by Sir James Mackenzie. In this country as in every civilized country the hospital system must be made to conform with modern views and not continued on the old lines merely because these are hallowed by tradition. In Great Britain, however, the hospital situation is more insistent and acute than in America. The hospitals there are one and all financially embarrassed, as well as being subject to the defects mentioned.

British hospitals, from time immemorial almost, have depended for their support on voluntary contributions, and, up to the time of the war, this system acted in a satisfactory manner on the whole. But the war has changed the entire aspect of affairs and at the present time most of the British hospitals are in a very parlous condition. In fact, if a rational scheme is not evolved soon worse results will ensue. The question is how are these indispensable institutions to be placed on a sound and solvent footing? While the voluntary system of maintaining hospitals has much to be said in its favor, it is nevertheless obvious that if this method does not bring in enough money to conduct the institutions in a proper way, it must either be modified or another plan must be thought out.

The statement, that without ample resources neither a hospital nor a medical school can discharge its functions or even continue to carry on at all, needs no argument. This fact is so thoroughly realized in most European countries that hospitals are maintained by the State or aided by municipalities or wealthy religious communities. It will be superfluous to enter into the many reasons why the voluntary system has proved inadequate. It is plainly evident that hospitals cannot continue to provide gratis medical and surgical attendance to all who ask for it. The most sensible way out of the quandary would seem to be the introduction of the pay ward system or partial pay ward system. At any rate, the hospitals might charge for the board, lodging and drugs supplied. Some institutions have done this.

The class for whom the British voluntary hospitals were in the first instance established, the really poor, are no longer with us, or rather are with us in another guise. Working men and small tradesmen are nowadays comparatively well to do and can easily afford to pay for hospital care and treatment and undoubtedly many in and outpatients are obtaining for nothing the treatment and medicines for which they are able to make a moderate

payment. The poor in Great Britain at the present time are the middle classes who are overburdened with taxation from which the working classes are almost entirely exempt, and the former have never resorted to hospitals, but doubtless would be glad to do so if they could be received as paying guests. State aid is abhorrent to British individualism and the alternative, the pay ward, would appear to be much better suited to the character of the people. In this country the pay ward system, as a rule, works well, it tends to promote self-respect and independence and is fair to all. People will go to hospitals much more than ever before. Home treatment, except for minor ailments, is becoming less and less common.

The future of hospitals is full of promise but at the same time it should be understood that they must move with the times, and that both for preventive and curative and remedial treatment they must be so constituted and equipped that they provide absolutely the best means of treatment. The situation as regards British hospitals has been dealt with in order that the American medical profession may understand the difficulties which confront the medical profession in the British Isles. Some of our readers may like to discuss the point as to how the pay ward system has worked generally in America and to suggest ideas as to the hospital of the future.

PHYSICIAN-AUTHORS: DR. ERASMUS DARWIN.

All educated people today are more or less familiar with the Darwinian theory, evolved by Charles R. Darwin, the greatest English naturalist of the nineteenth century and author of *The Origin of Species* and *The Descent of Man*. Comparatively few, however, know that Darwin succeeded to an intellectual inheritance and carried out a program sketched and left behind by his grandfather, Dr. Erasmus Darwin, an eighteenth century English physician who was possessed of an indefatigable spirit of research and almost the same biological tendency as his illustrious grandson. Both had theories of evolution. The fame of the grandson is based almost wholly upon the theory he so ably expounded, but the grandfather and his theory have been lost sight of almost completely. And yet it was he, and not Lamarck, the French zoologist, who originated the doctrine of organic evolution and of invertebrate paleontology—in other words, that all living beings arose from germs through spontaneous generation. Dr. Samuel Butler—the *Erwhonian* Butler—openly accused Lamarck of having gotten his ideas from Erasmus

Darwin's *Zoonomia*, and in his *Evolution Old and New* Butler takes pains to show the complete coincidence of Dr. Darwin's views with those later expressed by Lamarck. "The chief fault with Dr. Darwin's treatise on evolution," says Butler, "is that there is not enough of it; what there is, so far from being 'erroneous' (as Charles Darwin contended), is admirable. But so great a subject should have had a book by itself, not a mere fraction of a book. . . . That is the only way men can expect to succeed against the vested interests. Dr. Darwin has said enough to show that he had the whole thing clearly before him, and could have elaborated it as finely as or better than Lamarck himself has done, yet the palm must be given to Lamarck on the score of what he actually did, and this, I observe to be the verdict of history, for whereas Lamarck's name is still daily quoted, Dr. Darwin's is seldom mentioned, and never with the applause it deserves."

The essence of Dr. Darwin's theory of evolution is contained in the following passage: "Would it be too bold to imagine that, in the great length of time since the earth began to exist, perhaps millions of ages before the commencement of the history of mankind—would it be too bold to imagine that all warm blooded animals have arisen from one living filament, which the First Cause endued with animality, with the purpose of acquiring new parts, attended with new propensities, directed by irritations, sensations, volitions and associations, and thus possessing the faculty to continue to improve by its own inherent activity, and of delivering down these improvements by generation to its posterity, world without end!"

Zoonomia, in which this theory appeared, was Dr. Darwin's chief prose work. It has been described as "an exhaustless repository of interesting facts, of curious experiments in natural production and in medical effects." The second part of it is devoted to an enumeration of diseases, classified, and suggestions as to their medical treatment, illustrated by brief reports on cases. His theory of evolution was closely connected with his scheme of classifying diseases. The book was read extensively by medical men of Darwin's day, who highly esteemed him as a practitioner. The average man today never so much as heard of Dr. Darwin, but a little more than a century ago he enjoyed a world wide reputation as an author. This was due chiefly to his long didactic poem, *The Botanic Garden*, which was a literary sensation and enjoyed a best seller vogue not only in all English speaking countries but also in France, Germany, Spain, Italy and other countries.

It was in verse that Dr. Darwin usually expressed himself—verse that has been condemned by the critics as being more rhetorical than poetical, and monotonously bloodless and mechanical. Schiller, speaking of *The Botanic Garden*, called it "cold intellectuality disguised in verse"; Coleridge compared it to a Russian ice palace, "glittering, cold and transitory"; and the ruthless Sidney Lanier branded it as "the funniest earnest book in our language." It took Dr. Darwin several years to write *The Botanic Garden*. Every line of it was polished and sharpened elaborately, much of this being done as he rode from one patient to another. The first part appeared in 1781 and it was not until eight years later that the second part, called *The Loves of the Plants*, appeared. But despite the infinite pains Dr. Darwin took with it, its only merit lies in its scientific enthusiasm and the great knowledge of nature which it displays. Dr. Darwin decidedly was no poet. Here and there there are flashes of genuine beauty, but these are very rare. Generally his style is so pompous that it becomes ridiculous and the whole effect is one of artificiality.

The novelty of *The Botanic Garden* had much to do with its wide popularity. It personified the plants (in accordance with the system of Linnaeus, the Swedish naturalist, who demonstrated that all flowers contain families of males or females or both) and described their love affairs. It was an ingenious attempt to unite science and poetry but was almost as short lived as a flower itself. In personifying plant life the Belgian author, Maeterlinck, has done a much better job.

Dr. Darwin's other poetical works were *The Temple of Nature* with philosophical notes, and *The Shrine of Nature*, both of which were published posthumously, and in both of which Darwin embodied an amazing amount of nature research and observation.

Besides *Zoonomia*, Darwin's prose works included *Phytologia, or The Philosophy of Agriculture and Gardening*, in which he announced his belief that plants have sense and volition, and a paper on *Female Education in Boarding Schools*.

In addition to his medical practice and his writing, Darwin was an ardent prohibition worker, one of the pioneer drys, and did much to diminish drunkenness among the poorer classes. Dr. Darwin was born at Elton, Nottinghamshire, England, on December 12, 1731. He studied at St. John's College, Cambridge, then at Edinburgh, and in 1756 began the practice of medicine in Nottingham. Later he practised at Litchfield and at Derby, where he died on April 18, 1802.

SELFCERTIFIED.

Efforts at prevention of disease have gone as far back as endeavoring to influence the shadowy ghost of infant life which feebly raps upon the gate of life as it still lies in the womb. Giving all prenatal care to the mother of the unborn child is a great advance. The great cry now is "Prevent, prevent," and one, almost as loud, is "cooperate," the last phase of cooperation occurring in the British Ministry of Health Bill, Part II, asking the victims of incipient mental disorder, but not yet lunatic, to become voluntary boarders for six months at an institution approved by the Minister of Health, two doctors certifying that by such treatment he is likely to benefit. No stigma of insanity will be attached, and free exit will be allowed. Periodical inspection by health officials will be made. It will also ease families from that most dreaded task of having a member put away for his own protection and that of others.

The special committee of the medicopsychological urge this as an amendment and not a revision of the Lunacy Acts. They urge the need of imposing upon local authorities the duty of providing the requisite treatment directly or through voluntary organization and insist there shall be special staffing and special management, the institution shall be apart from the asylum, as any association would fatally prejudice the place in the eyes of the people.

It is true that there are hundreds who feel they are going mad who dare not confess to being conscious of it because of the stigma on the family (hereditariness) and the horrible fear of being shut up behind bolts and bars, release coming only by consent of relations and doctors. If such institutions were established, a man would have the same relief on giving up the fight against insanity as he has when beaten by any other disease and finally lays his weary head on the pillow and lets that mighty, swift flying, life battering business world go its way without his very important direction. There would be no madness in taking a prolonged rest, rather, the most suspicious would be inclined to regard a man as sane for so doing. A difficulty will be in keeping out those neurotics who keep a mental microscopic, periscopic, telescopic, eye open to all their own symptoms and would rather be treated for insanity than not noticed at all.

A NEW OBSTETRICAL JOURNAL.

The American Journal of Obstetrics and Gynecology, a new monthly periodical devoted to obstetrics and gynecology, made its first appearance in October. Dr. George W. Kosmak, of New York, is editor of the new journal; Dr. Hugo Ehrenfest,

of St. Louis, is associate editor, and many of America's leading obstetricians and gynecologists lend their names to the editorial board. It is stated that a special feature will be the department devoted to current medical literature, which will be under the direction of Dr. Ehrenfest. The first issue of the new journal presents an excellent appearance, and if it fulfills the promise of this first issue it should prove a valuable addition to the medical publications of this country. It is published by the C. V. Mosby Company, St. Louis, Mo.

A PHYSICIAN IN THE HALL OF FAME.

Dr. William Thomas Greene Morton has been elected to a place among the men of achievement in the Hall of Fame. Dr. Morton was first a dental surgeon and later a physician. He received his M. D. from Washington University in 1849. He discovered anesthesia and in this way brought a boon to mankind. Artificial sleep could be induced, enabling surgeons to perform the needful operations, at the same time avoiding pain for the patient. His discovery he called *letheon*; today it is known as ether. The discovery was made public by an operation performed in the Massachusetts General Hospital, October 16, 1846, by Dr. J. C. Warren, to whom Morton had communicated his discovery. To honor the discoverer of this blessing to disordered humanity, the French Academy of Science awarded Morton the Monthyon prize of twenty-five hundred francs.

Obituary.

ISADORE DYER, M. D.,
of New Orleans.

One of the best known and most loved of America's physicians, Dr. Isadore Dyer, died at his home in New Orleans on the morning of October 12, 1920. For thirty years he had given the best of himself in his practice, in his writings and as the coeditor of the *New Orleans Medical and Surgical Journal* and the *American Journal of Tropical Medicine*. He was born in Galveston, Texas, fifty-four years ago and was graduated from the Sheffield Scientific School in 1887 and from Tulane University in 1889. He then began to specialize in skin diseases, serving an internship at the New York Skin and Cancer Hospital. For thirteen years he lectured on diseases of the skin at Tulane University. In 1905 he was made associate professor and finally in 1908 he became professor and dean of the medical school, a position he held until his death. The study of leprosy attracted him and it was with this disease that his name was most frequently associated. He was the founder and the president of the first board of directors of the Louisiana Lepers' Home, and one of the most active physicians connected with this institution. Dr. Dyer was also a member of the Medical Corps of the U. S. Army, achieving the rank of colonel in 1919. His was a useful work in the service of mankind and for this and for his pleasing personality he will be remembered by his patients and colleagues.

News Items.

Harvey Lecture.—The third lecture in the course will be given Saturday evening, November 20th, by Dr. Nellis B. Foster, of Cornell University Medical College, his subject being Uremia.

New Building for National Academy of Sciences.—A site has been obtained for the new building which is to be erected in Washington, D. C., to serve as a home for the National Academy of Sciences and the National Research Council. It comprises the block bounded by B and C and Twenty-first and Twenty-second Streets.

New York State's Birth Rate.—During the four years 1914-1917 the average annual birth rate for the State of New York was 23.8 to the thousand population; in 1918 it fell to 22.7 and in 1919 it declined still further to 20.8. During the first eight months of 1920 the birth rate was 21.7 for the entire state; 22.2 for New York city and 21.0 for the rest of the state.

Mental Hygiene Course at Columbia.—An extension course in mental hygiene for community workers is being given in the sociology department of Columbia University. During the course lectures on special topics will be delivered by Dr. Thomas W. Salmon, Dr. W. A. White, Dr. Pearce Bailey, Dr. Louis Casamajor, Prof. R. S. Woodworth, Dr. William Healy, Dr. Charles B. Davenport, Dr. F. E. Williams, Dr. Walter E. Fernald, Dr. Bernard Glueck, and Miss Maude Miner.

American Public Health Association.—At the annual meeting of this association, held in San Francisco, Cal., on September 15th, the following officers were elected: President, Dr. M. P. Ravenel, of Columbia, Mo.; first vice-president, Dr. Theodore B. Beatty, of Salt Lake City, Utah; second vice-president, Dr. Louis I. Dublin, of New York; third vice-president, Dr. W. C. Hassler, of San Francisco; secretary, Mr. A. W. Hedrich, of Boston; treasurer, Dr. Roger I. Lee, of Cambridge, Mass.

American Association of Military Röntgenologists.—At the recent annual meeting of the American Röntgen Ray Society, the American Association of Military Röntgenologists was organized, with the following officers to serve for the first year: Dr. Arthur C. Christie, of Washington, D. C., president; Dr. Henry K. Pancoast, of Philadelphia, vice-president; Dr. Francis F. Borzell, of Philadelphia, secretary. All officers of the medical and sanitary corps who were actively engaged in x ray work during the war are eligible to membership in the association.

Danger in Horse Hair Shaving Brushes.—The United States Public Health Service issues a warning against the use of horsehair shaving brushes, as a number of cases of anthrax have been traced to their use. Surgeon General Cumming says that every effort possible under existing laws has been made to prevent the occurrence of anthrax due to infected shaving brushes, but in spite of all efforts cases of anthrax will occur as long as the public buys and uses shaving brushes made of horse hair. He says that Congress will be asked to prohibit the use of horsehair for that purpose.

Plague Research in Florida.—The United States Public Health Service has established at Pensacola, Fla., a research station for the study of bubonic plague. Additional trained experts have been detailed to cooperate with those already stationed there, and an increase in research equipment to facilitate investigations will be provided.

Johns Hopkins May Have a Reserve Medical Officers' Training School.—Surgeon General Merritte W. Ireland, United States Army, has offered to establish a Reserve Officers' Medical Training Corps at Johns Hopkins Medical School, provided at least fifty students will agree to enroll in it. The trustees of the school have accepted the offer.

Brooklyn Hospitals Meet Requirements of American College of Surgeons.—Standards of hospital efficiency and administration set by the American College of Surgeons have been met by the following Brooklyn hospitals: Cumberland Street Hospital, Greenpoint Hospital, Coney Island Hospital, and Kings County Hospital. These are all general hospitals conducted under the direction of the Department of Public Welfare.

Philadelphia County Medical Society.—At a business meeting of this society, held on the evening of October 20th, the following officers were nominated for the coming year: President, Dr. John W. West and Dr. G. Morris Piersol; vice-president, Dr. Wilmer Krusen; secretary, Dr. J. Morton Boice; treasurer, Dr. Edward A. Shumway; assistant secretary, Dr. Charles Scott Miller; directors, Dr. F. Hurst Maier, Dr. William E. Parke, and Dr. George A. Knowles; censor, Dr. Levi J. Hammond; district censor to the State society, Dr. E. E. Montgomery.

Kentucky Medical Association.—At the seventieth annual meeting of this association, held in Lexington on September 27th to 30th, Dr. William W. Anderson, of Newport, was elected president, succeeding Dr. John G. South, of Frankfort, and other officers were elected as follows: Dr. Joseph A. Stucky, of Lexington, president-elect; Dr. Robert H. Cowley, of Berea, first vice-president; Dr. Alice N. Pickett, of Louisville, second vice-president; Dr. Elbert W. Jackson, of Paducah, third vice-president; Dr. Arthur T. McCormack, of Bowling Green, secretary. Next year's meeting will be held in Louisville.

University of Buffalo Endowment Fund.—The long felt need for an adequate endowment fund for the University of Buffalo has been recently realized, a campaign made from October 7th to 17th for a five million dollar endowment fund resulting in a total of about \$5,100,000. The scheme of the campus was chosen from competitive plans submitted by landscape architects. The style of the architecture is to be Georgian Colonial. The first building, now in process of construction at an estimated cost of \$400,000, will be devoted to the teaching of chemistry. The liberal arts, library and administration buildings will be the next erected. Other buildings will naturally follow in the development of the University plan. The income from the remaining funds will be available for the use of the several departments.

Relief Work in the Crimea.—To meet the increasing needs of the civilian population and thousands of refugees in the Crimea, the American Red Cross unit there has been authorized to increase its distribution of food and supplies to 500 tons weekly. Supplies now held at the Constantinople base have been made immediately available for this purpose and will be rushed to the Crimean unit as rapidly as distribution warrants. For the purpose of quickly organizing an effective system of distribution throughout the stricken areas, the personnel of the Red Cross unit has been increased to twenty-five men. Native labor is assisting in the work. The work of the American Red Cross in this section is confined entirely to the civilian population.

Civil Service Examinations.—The United States Civil Service Commission announces an examination for the position of physician in the Panama Canal Service, which will be held at various points throughout the United States on December 15, 1920, and January 19 and March 9, 1921. The entrance salary is \$250 a month, and promotion may be made to as high as \$360 and to higher rates for special positions. The salary begins on the date of sailing. Applicants must have graduated from a recognized medical school and have had at least one year's postgraduate hospital experience. They must have reached their twenty-second but not their thirty-first birthday.

Another examination will be held for the position of medical intern in St. Elizabeth's hospital, Washington, D. C., for which applications will be received until March 1, 1921. The salary is \$1200 a year and maintenance. Applicants must not have graduated in medicine previous to the year 1915 unless they have been continuously engaged in hospital, laboratory, or research work along the lines of neurology or psychiatry since graduation.

Personal.—Dr. James F. McKernon has been elected president of the New York Post-Graduate Medical School and Hospital, to succeed Dr. Frederic E. Sondern.

Dr. Blanche Norton, an American physician, has been awarded the Cross of King George I in recognition of her work among the trachoma victims in Greece.

Dr. José S. Salas, of the Chilean Army Medical Corps, is visiting the United States for the purpose of studying methods of venereal disease control.

Dr. Bowman L. Robinson, of the University of Wisconsin, has been appointed professor of hygiene in the University of Mississippi.

Dr. David E. Hoag, has been made associate in neurology, in the department of nervous and mental diseases, at the New York Post-Graduate Medical School and Hospital; also lecturer on nervous and mental diseases, at the University and Bellevue Hospital Medical College.

Dr. James Ewing, professor of pathology at Cornell University Medical College, and former director of cancer research at the General Memorial Hospital, New York, has been appointed a member of the board of trustees of the State Institute for the Study of Malignant Disease, at Buffalo, to fill a vacancy caused by the resignation of Dr. Seymour Oppenheimer.

To Register Disabled Veterans for Vocational Training.—A three months' campaign to register disabled soldiers and sailors for vocational training and education has been inaugurated by the Federal Board for Vocational Training. The board announces that no effort will be spared to locate deserving men who have been injured in military service and to see that every ex-service man entitled to training actually gets it. The \$90,000,000 appropriated by congress for their rehabilitation is now being distributed in the form of compensation ranging from \$80 to \$170 a month.

Meetings of Local Medical Societies.—The following medical societies will meet in New York during the coming week:

MONDAY, *November 15th.*—New York Academy of Medicine (Section in Ophthalmology); Medical Association of the Greater City of New York; Psychiatric Society of Ward's Island.

TUESDAY, *November 16th.*—New York Academy of Medicine (Section in Medicine); Federation of Medical Economic Leagues of New York.

WEDNESDAY, *November 17th.*—New York Academy of Medicine (Section in Genitourinary Diseases); Medico-legal Society; Northwestern Medical and Surgical Society of New York; Woman's Medical Association of New York City; Alumni Association of the City Hospital.

THURSDAY, *November 18th.*—New York Academy of Medicine (stated meeting); New York Celtic Medical Society.

FRIDAY, *November 19th.*—New York Academy of Medicine (Section in Orthopedic Surgery); Clinical Society of the New York Postgraduate Medical School and Hospital; New York Microscopical Society; Alumni Association of Roosevelt Hospital; Brooklyn Medical Society.

Died.

BERNARD.—In Boston, Mass., on Thursday, October 28th, Dr. Barnard L. Bernard, aged fifty-seven years.

BELL.—In Ogdensburg, N. Y., on Thursday, October 28th, Dr. Willard N. Bell, aged sixty-two years.

BOUTWELL.—In Manchester, N. H., on Tuesday, November 4th, Dr. Henry W. Boutwell, aged seventy-two years.

COHOON.—In Los Angeles, Cal., on Friday, October 22nd, Dr. Brock E. Cohoon, of Seattle, Wash., aged thirty-seven years.

COLEMAN.—In Mineral, Va., on Sunday, October 31st, Dr. William J. Coleman, aged sixty-four years.

DENCHFIELD.—In New York, on Thursday, November 4th, Dr. Levi J. Denchfield, aged sixty-five years.

FEATHERSTONHAUGH.—In Duanesburg, N. Y., on Wednesday, October 27th, Dr. Thomas Featherstonhaugh, aged seventy-two years.

GERHARD.—In Philadelphia, Pa., on Tuesday, October 26th, Dr. George Gerhard, aged seventy-one years.

HAWLEY.—In Kalamazoo, Mich., on Monday, October 25th, Dr. Alanson W. Hawley, of Seattle, Wash., aged fifty-four years.

HORNING.—In Norristown, Pa., on Friday, October 26th, Dr. Samuel W. Horning, aged fifty-eight years.

LOTHROP.—In Stanley, Wis., on Tuesday, October 6th, Dr. C. A. Lothrop, aged thirty-eight years.

MELTZER.—In New York, on Sunday, November 7th, Dr. Samuel James Meltzer, aged sixty-nine years.

MORRIS.—In Rockville, Ind., on Thursday, October 28th, Dr. Charles C. Morris, aged seventy-two years.

NEWCOMET.—In Stouchsburg, Pa., on Monday, November 1st, Dr. I. W. Newcomet, aged seventy-seven years.

NOBLE.—In Greencastle, Pa., on Thursday, October 29th, Dr. William P. Noble, aged seventy-five years.

PALMER.—In Johnsonburg, Pa., on Wednesday, November 3rd, Dr. William R. Palmer, aged fifty-seven years.

Book Reviews

STERILITY.

Sterility in Women. By ARTHUR E. GILES, M.D., B.Sc. (London), M.B., Ch.B. (Vict.), F.R.C.S. (Edin.), M.R.C.P. (London), Captain, R.A.M.C. (Temp.); Senior Surgeon to the Chelsea Hospital for Women; Gynecologist to the Prince of Wales's General Hospital, Tottenham. Illustrated. London: Henry Frowde (Oxford University Press) and Hodder & Stoughton, 1919. Pp. xi-227.

Giles, in his preface, considers sterility as an important after the war problem rather than a sociological or biological one. He thinks that with the limitation of marriages those that are consummated should at least be fruitful. Of course it is to be remembered that he is speaking now for England, where conditions are not the same as in this country. On the other hand, when he takes up the issue from his point of view he straightway encounters opposition. First, he will find those who believe in birth control and in this camp recruits have come for two main reasons: The expenditure of energy, men and materials have accentuated the struggle for livelihood, and the lesson of the war, when the sons of Europe's greatest countries were lined up one camp against the other. They do not want their offspring to furnish cannon fodder; to live in vermin filled dugouts; or to become fertilizer for fields made bloody at the will of senile statesmen who have outlived their usefulness. This at least is the argument offered by a faction of the great group who are more interested in controlling the number of their offspring rather than in methods which will ensure their having offspring. This argument is mentioned, not to disprove any of the scientific facts which Giles presents, but merely to check up the motives for which the book was written. Europe was steeped in the turmoil of war for so long a period that many of the inhabitants, victims of quickly formed habits, began to think that war was a normal state of affairs. Many of these people find it hard to adjust themselves to the new conditions; in fact, for a goodly portion of the population peace brought few changes. The tension has been removed, somewhat, but conditions are far from what we were pleased to call normal before the war.

In view of all this we shall disregard what Giles says in his none too spontaneous introduction and consider his researches from a scientific viewpoint alone.

First of all, in considering the etiology of sterility in women, which is the subject discussed, it must be ascertained if the fault lies with the man. This is for the process of elimination. Various authors differ in their estimate of the responsibility of the male, the figures varying from ten to ninety per cent., a wide range, certainly. Most of these references are taken from Hühner. The estimates of the proportion of unproductive marriages also vary from two to over twenty per cent. These figures do not seem high, for most women who are desirous of offspring will sooner or later seek the aid of a gynecologist, and often more than one. So, considering these points, the figures when reduced to the lowest estimate could be lowered considerably

as applied to the population at large. It is somewhat confusing in studying these statistics to find spinsters listed among the case histories studied. From any angle it is difficult to find a reason for this compulsion for completeness on the part of the author. The same note may be made about acrobatic statements such as, "We can say that a woman is sterile and will remain so, whether she be a virgin or a married woman."

First of all the various mechanical defects and obstacles are considered. These are many and varied, some capable of correction and others irremedial. Then sterility—and here the author makes the distinction between sterility and non-productiveness—is divided into functional, primary (acquired and congenital), and secondary. A glance at the list will convince one that many conditions are to be considered. Among the functional causes are grouped: impotence of husband, nonoccurrence of coitus, vaginismus, dyspareunia, sex incompatibility. Then primary sterility is made to embrace the congenital variety, of malformations preventing intercourse, such as absence of vagina, atresia of the vagina, stenosis of the vagina, and where intercourse is allowed, absence or underdevelopment of the ovaries, atresia of the fallopian tubes, atresia of the os uteri, underdevelopment or ante flexion and stenosis of the uterus. Then we have a long list under acquired sterility due to causes such as injuries to the vagina and cervix causing stenosis and atresia, cessation of ovarian activity, pelvic inflammation, uterine displacements, ovarian and uterine tumors and uterine fibrosis.

We have yet to dispose of the secondary sterility due to the effects of labor and the other effects of acquired sterility. Quite a list for so small a proportion of sterile women. However, we might add that this list is not complete, for there are other causes in addition to the long list enumerated. These various causes of sterility have been carefully gone over by Giles and he has assembled a formidable array of literature on the subject. There is little to denote that much recent progress has been made. For example, in considering vaginismus, after allowing that the condition is one of psychic origin, the treatment advised is dilatation. It is stated that the results have been satisfactory for this method of treatment. But it hardly seems consistent to find one cause and then turn about and treat the effect. More recent workers have been successful in their treatment of sterility, when the dysfunction is due to endocrine disorders, by the use of various glands of internal secretion. This seems a field of considerable importance, yet Giles has little to say about it. He confines himself in the main to the grosser, more obvious anatomical and physiological disorders which usually require the surgical or medical hero to correct. So it is with the psychic disorders which he brushes away with a mere mention. The fact that sterility is encountered almost twice as frequently among the well to do should lead us to look into the finer and more important mechanisms which control the workings of the complex human organism.

MATERNITY.

Maternitas. A Book Concerning the Care of the Prospective Mother and Her Child. By CHARLES E. PADDOCK, M. D., Professor of Obstetrics, Chicago Post-graduate Medical School; Assistant Clinical Professor of Obstetrics, Rush Medical College; Attending Obstetrician, St. Luke's Hospital. Illustrated. Chicago: Lloyd J. Head & Co., 1920. Pp. 210.

Half a century ago, the condition of pregnancy and the safe delivery of babies was considered rather an indelicate subject, and it was only whispered that a lady was "in the family way." Books on the subject were few and any possessed were carefully hidden, and so was the young mother to within a month of her delivery, her nerves and her appearance supposedly justifying this, and for a month afterwards she kept to her bed or sofa mainly with the idea of preserving her figure.

Perhaps the young mother of today goes to the other extreme through ignorance or daring. In this book she finds none but reasonable precautions urged and their necessity. Elderly mothers may dissuade the younger ones from reading by quoting those who have had large and healthy families in defiance of all the rules now considered obligatory, but if a record of those who failed were given it would considerably outnumber the totally healthy. The book is not overloaded with details likely to alarm the mother, because the advice generally winds up with "send for the physician." There might be a chapter for mothers in outlying districts and far away places on What to Do When the Doctor Can't Come; but, seriously, the book seems sufficient without sending for him.

The new baby is to have no rubber "comforter," and no kisses except a few sterilized ones from the parents on the forehead or cheek. It is not to suck its thumb or eat pins, buttons and marbles. Part of the daily exercise is "kicking, screaming, and waving the arms," but the screams of illness, hunger and cussedness should be differentiated. Mrs. John Wesley used to spank it for the third, first for crying, then for crying because it disapproved the laying on of hands. The infant is to be on good terms with the doctor, though the next bit of advice that the child should be taught as soon as possible to put out its tongue, is rather suggestive of a baby cave dweller, and not to be followed by polite infants.

The volume concludes with some useful recipes for both mother and child, and the whole tone is so reassuring and cheerful that prospective mothers may face maternity with a light heart.

MEDICAL BIOGRAPHIES.

American Medical Biographies. By HOWARD A. KELLY, M. D., LL. D., F. A. C. S., Hon. F. R. C. S. (Edin.), and WALTER L. BURRAGE, A. M., M. D. Second Edition, Revised and Enlarged. Baltimore: The Norman, Remington Company, 1920. Pp. xix-1320.

In seeking biographical material from books or friends, you get the man from various points of view—as his family, his patients, his confrères, and friends saw him. Often the titles, not the worth of his writings, is given, or his work is intentionally minimized or exaggerated. A man's work was not of much worth, perhaps, but he was, as his biography says "the beloved physician": yet

such qualification standing alone, though not excluding from an ordinary cemetery, would exclude from a hall of fame such as this volume appears intended to be. In the first edition such assertion was sometimes weakly conceded, but the editor says adverse criticism resulted in fifty-one exhumations before the second edition came out.

There will always be men who mistake fault-finding for criticism, but these, having scanned the lists, will agree that an adequate representation has been given to the three cities of New York, Philadelphia and Baltimore. Then there is the question of priority in work. The records of any law court will give surprising cases of similarity in ideas. Also, a man may conceive the idea but neither publish it nor give details except to a friend, so that when the other man proudly claims it as original, he is often quite justified, though the priority as given in a biography gives rise to some bitterness.

One good thing about the book is that it does not include the living. The inclusion would not matter so much if the men could undertake to live until a second edition appeared, otherwise there would be awkward fragments of mortality round the now completed life. Every day the tide of healers, themselves now wounded, is swirling on to death and a second edition. Many are said to create a void which can never be filled, or to have caused an irreparable loss, but such bold assertions as to the Creator's power to duplicate sink silent when the place is once more filled.

The book is not only useful for reference, but interesting in the glimpses it gives of the grim struggles of our earliest doctors against poverty, booklessness, ignorance, and loneliness. Interesting, too, to see how near they came to seeing truths now proved, how strenuously they fought for that which is now proved wrong; how pestilence and epidemic, their true cause now known, ruthlessly swept away both patients and doctors. This second, revised edition of Kelly's book should be welcomed everywhere.

NOCTURNE.

Nocturne. By FRANK SWINNERTON. New York: George H. Doran Company, 1917.

A reputation for perfection is a cross that any writer must bear as best he may. Frank Swinnerton seems to have achieved this dubious distinction by the publication of *Nocturne* and several other novels: as in the case of Leonard Merrick, the acclaim comes mostly from his fellow writers. It is only fair to say that Mr. Swinnerton will be most enjoyed where his reputation has not preceded him. But *Nocturne* is exceedingly interesting from another point of view. It is not perfect, but it is alive. Its spirit and imperfections are of the twentieth century; it is sharply modern even in the selfconsciousness that keeps it from quite achieving beauty. Few studies of women are more searching. There is in this book an unusual combination of effort and artlessness, of psychology and emotion, of classic unity with modern turbulence. It is a book which the reader will not immediately forget.

Emmy and Jenny, the two sisters of the story, are opposites. Emmy is the passive, incurious

woman, finding her complete expression in affection and homekeeping. Jenny is keen, restless, rebellious, impatient of restraints. The entire action of the story takes place on one night when Jenny finds that Emmy is in love with Al, a victim whom Jenny herself is merely dangling. Jenny sends them off to the theatre together and remains at home with Pa, who is paralyzed. But there comes a note from Keith, her sailor, saying that he is in London for just one night and cannot leave his ship, and asking her to come to him. Jenny hesitates between Pa and Keith, between duty and the one mad moment of adventure that may ever come to her, and she chooses Keith. When she returns it is to find Emmy and Al engaged. On the same evening each of the sisters has met her great moment in her own way. Emmy, of course, has no problem; she has found her man and she is satisfied. But there is still Jenny, poignant, unsatisfied Jenny, whose lover has sailed away again and who in addition has to bear her own reproaches because during her absence Pa fell and hurt himself; Jenny who does not want a stew and bread pudding existence; Jenny who is not commonplace but who has nothing ahead of her but commonplaceness. Jenny is not to be so easily dismissed. Her voice is added to the voices of revolt that are crying out everywhere in the world today—revolt against humdrum, empty lives, against the conditions that make men and women machines. She is youth demanding its own.

Mr. Swinnerton has done a rare thing in this book—he has made his characters reveal themselves to a remarkable extent through their own conversation. But, not satisfied with this, he has interpolated lumps of psychology that float around like indigestible dumplings in one of Emmy's own stews. It is drama plus a diagram, and the diagram is superfluous and annoying. One third of *Nocturne* could easily be cut out. But this, too, is characteristic. If Jenny is youth of today, Swinnerton is the writer of today, with a worthy desire to analyze and a fear of being merely limp. But *Nocturne* is an arresting book, and if its faults are those of modernity, who are we to cavil?

MAC OF PLACID.

Mac of Placid. By T. MORRIS LONGSTRETH. New York: The Century Company, 1920. Pp. xi-339.

It will soon be necessary to chart the world for writers and note the places where there is enough room for adventures. Travel by land, water and air, now so easy, quickly makes the unknown familiar and the poor authors have to stage their stories in long ago times when real statisticians and bacteriologists, automobiles, thermos flasks, canned goods and first aid had not arrived. Longstreth chooses the Adirondacks when loggers, hunters and trappers were the chief dwellers, and here he plants Mac at Saranac to win Hallie and circumvent the evil designs of a certain wild Tess and her helper, Ed Touch. Robert Louis Stevenson also spends a winter with Mac and draws plans for Mac's successful wooing of Hallie. But it is not the story itself, though that is sufficiently thrilling; it is the pictures of the country, or, more than pictures, scenes in which you feel the blinding snow and seek some shelter from the pitiless rainstorm. You

stand, forgetting it is only in a book, in reverent silence among the giant trees and see the final advent of spring as a marvelously beautiful coming never seen before. Longstreth loves the Adirondacks and makes his readers see and love them also.

PEARLS ASTRAY.

Pearls Astray. A Romantic Episode of the Last Democracy. By CONSTANCE M. WARREN. Illustrated. Boston: Small, Maynard & Co., 1920. Pp. 158.

This is the dream of a millionaire whose dinner has evidently disagreed with him. It embodies all the delusions caused, and then some. It is a misleading and clever piece of work, with apt characterizations and amusing pictures.

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

ANNIVERSARY TRIBUTE TO GEORGE MARTIN KOBER IN CELEBRATION OF HIS SEVENTIETH BIRTHDAY. By His Friends and Associates, on March 28, 1920. Edited by Rev. FRANCIS A. TONDORF, S. J., Ph. D. Washington, D. C., 1920. Pp. 381.

THE SCHOOL OF SALERNUM. REGIMEN SANITATIS SALERNITANUM. The English Version by Sir JOHN HARRINGTON. History of the School of Salerno, by FRANCIS R. PACKARD M. D. A Note on the Prehistory of the Regimen Sanitatis, by FIELDING H. GARRISON, M. D. New York: Paul B. Hoeber, 1920. Pp. 213.

ELECTROTHERAPY. ITS RATIONALE AND INDICATIONS. By J. CURTIS WEBB, M. A., M. B., B. C. (Cantab.), Hon. Associate of the Order of St. John of Jerusalem; Order of Merit of the Cruz Vermebla; Hon. Associate, King's College, London, etc. With Six Diagrams. Philadelphia: P. Blakiston's Son & Co., 1920. Pp. 90.

A COURSE OF LECTURES ON MEDICINE TO NURSES. By HERBERT E. CUFF, M. D., F. R. C. S., Principal Medical Officer to the Metropolitan Asylum Board; Late Medical Superintendent, North Eastern Fever Hospital, Tottenham, London. Seventh Edition, with Twenty-Nine Illustrations. Philadelphia: P. Blakiston's Son & Co., 1920. Pp. vii-257.

PUBLIC HEALTH LABORATORY WORK (CHEMISTRY). By HENRY R. KENWOOD, C. M. G., M. B., F. R. S. (Edin.), D. P. H., F. C. S., Chadwick Professor of Hygiene and Public Health, University of London; Medical Officer of Health and Public Analyst for the Metropolitan Borough of Stoke Newington. Seventh Edition, with Illustrations. New York: Paul B. Hoeber, 1920. Pp. xi-420.

PHYSIOLOGY AND BIOCHEMISTRY IN MODERN MEDICINE. By J. J. R. MACLEOD, M. B., Professor of Physiology in the University of Toronto, Toronto, Canada; Formerly Professor of Physiology in the Western Reserve University, Cleveland, Ohio, Assisted by ROY G. PEARCE, A. C. REDFIELD, N. B. TAYLOR, and Others. Third Edition, with Two Hundred and Forty-three Illustrations, Including Nine Plates in Color. St. Louis: C. V. Mosby Company, 1920. Pp. xxxii-992.

MASSAGE. ITS PRINCIPLES AND PRACTICE. By JAMES B. MENNELL, M. D., M. B., B. C. (Cantab.), etc., Medical Officer, Physico-Therapeutic Department, St. Thomas's Hospital; Medical Officer in Charge of the Massage Department, Special Surgical Hospital, Shepherd's Bush; Author of *The Treatment of Fracture by Mobilization and Massage*. With an Introduction by Sir ROBERT JONES, K. B. E., C. B., F. R. C. S., Major General, A. M. S., Inspector of Special Military Surgery. Second Edition. With One Hundred and Sixty-seven Illustrations and Two Appendices. Philadelphia: P. Blakiston's Son & Co., 1920. Pp. xvi-535.

Practical Therapeutics and Preventive Medicine

A Compendium of Treatment and Prophylaxis, Original and Adapted

Venous Thrombosis, Pulmonary Infarction, and Embolism Following Gynecological Operations.—H. H. Hampton and Lawrence R. Wharton (*Bulletin of the Johns Hopkins Hospital*, April, 1920) have analyzed the cases of thrombosis occurring in the Johns Hopkins Hospital from 1890 to 1918 inclusive. During the period 21,000 patients were operated on in the gynecological clinic, with 205 cases of femoral thrombophlébitis following all types of gynecological operations, or an incidence of one per cent. From their extensive study of these cases the following conclusions are drawn: Post-operative venous phlebitis and thrombosis are not peculiar to any particular type of gynecological operation. Of the conditions favoring thrombus formation infection and trauma are the most important. Nearly all the cases of thrombophlebitis are associated with a slight rise in temperature. Phlebitis and thrombosis when associated with pain and swelling are rarely ever followed by fatal embolism. Pulmonary infarction occurs most often in the same class of cases and during the same period of convalescence as femoral thrombophlebitis. Pulmonary infarction may precede pulmonary embolism. Post-operative pulmonary infarction in the majority of cases has heretofore been unrecognized. Its diagnosis must be based on the clinical picture rather than the physical findings alone, and the authors believe that with proper care pulmonary infarction should be diagnosed.

Cicatricial Laryngeal Stenosis in Children.—E. J. Moure (*Journal de médecine de Bordeaux*, February 10, 1920) notes that occasionally this condition is due to ulcerations of the laryngotracheal canal; from diphtheria, measles, scarlet fever, or rarely, typhoid fever. More frequently, however, it results from tracheotomy improperly performed, viz., through the thyroid cartilage, the intercricothyroid space, or simply through the cricoid. The practitioner called in an emergency to a child threatened with asphyxia opens into the laryngotracheal canal at the most convenient point for insertion of the cannula. Some time later he finds that upon tentative removal of the cannula dyspnea reappears, and is prone at once to ascribe the difficulty to a spasmodic closure of the glottis, preventing removal of the cannula. Examination of the child, still wearing the cannula, some months later, reveals a more or less tight stenosis of the larynx, with immobility of the arytenoids in the median line, and below these, bilateral subglottic infiltration. External inspection shows that the opening for the cannula had been made in a faulty position. The proper treatment in such cases is to ignore the larynx and simply make a new opening for the cannula into the trachea itself. Under these conditions patency of the canal will become gradually reestablished and the opportunity given for removal of the tube. During this time the attendant's chief solicitude should be to prevent pericannular accumulation of granula-

tions by excising from time to time or cauterizing with the electrocautery or one in ten chloride of zinc solution the exuberant granulations which invariably develop within a few months. In no case, however, should the cannula be removed without examination as to the permeability of the larynx by laryngoscopy. The children should be trained to breathe through the normal channels by stopping the cannula at first during the daytime only, and later at night. The special cannulas recommended by former writers are unnecessary. In the exceptional cases in which stenosis is actually found to be due to cicatricial tissue within the larynx, the delay will not have been without advantage, for children seven or eight years old are much more favorably situated for supporting the necessary operative procedure than smaller children.

Barium Chloride and Cardiac Inhibition.—Tournade (*Paris médicale*, March 13, 1920) notes that barium chloride antagonizes the slowing of the heart rate caused by stimulation of the vagus nerve. The problem arises, whether this effect on the part of the barium salt is due to paralysis of the vagus, or to a stimulation of the intracardiac nervous structures, thus rendering the heart refractory to the influence of the vagus. The author placed a ligature about the auriculoventricular furrow on the heart of a young dog extracted from the uterus at term. The frequency of the auricular contractions was thus rendered double that of the ventricular beats. When a few drops of barium chloride solution were then injected into the left ventricle, the ventricular beats were accelerated and became much more frequent than the auricular. This was taken to show that barium chloride acts by excitation of the cardiac nervous mechanism.

Intracardiac Pressure as a Standard in Cardiotherapy.—I. Harris (*Lancet*, May 1, 1920) bases his therapy in cardiac failure on the intracardiac pressure as determined by measuring the length of diastole in comparison with the length of systole. The measurement is done with the electrocardiograph. It is assumed that a relatively long diastole compared with systole signifies a high intracardiac pressure, since a long diastole allows a large amount of blood to collect in the ventricle which must be forced out quickly during the short systole. The fact that this measure is only approximate and not necessarily true in all circumstances is recognized, but it is considered true in the majority of cases. Two types of cardiac failure are recognized in this classification, the first with a low intracardiac pressure because of a short diastole and rapid heart rate accompanying a flabby inefficient heart muscle, and the second accompanied by arterial damage, high blood pressure, slow heart rate, long relative diastole, and a very high intracardiac pressure. The treatment of the first type must obviously be directed toward an improvement of the tone, and strength of the muscle wall. Digitalis is the drug

of all others to be chosen here as its tonic effects will be produced before its pressure raising effect can do damage. The amount of drug to be used is regulated by observing the effects of the intracardiac pressure. In the second type of case it is necessary to reduce the intracardiac pressure and caffeine seems to be the most satisfactory drug, though in many cases it cannot be used over long periods because of its property of increasing the nervous excitability of the patient. When it can be no longer used atropine must take its place. As this reduces the intracardiac pressure by increasing the heart rate, digitalis in small doses should be used, for, even in rapid heart action, digitalis benefits the heart muscle. Adrenalin also seems to be beneficial in such cases, particularly in cases with edema, since the author considers it to be a diuretic which does not affect the intracardiac pressure.

Effect of High Temperature upon the Action and Toxicity of Digitalis.—Hirschfelder, Bicek, Kucera, and Hanson (*Journal of Pharmacology and Experimental Therapeutics*, July, 1920) found that the lethal dose of digitalis for cats whose temperature was elevated to 43° C. is much smaller than the lethal dose at normal temperatures. In the febrile animals the drug was found to cause the typical slowing of the pulse rate and increase in the blood pressure, as well as ventricular extrasystoles and inversion of the T wave in the electrocardiogram. Although the heart muscle in these experiments was free from any injury due to prolonged fever or toxemia, the high temperature factor alone was enough to increase greatly its susceptibility to the effects of digitalis. Great care should therefore be exercised in using digitalis in large doses in patients with high fever. For animals at 43° C., the dose recommended by Eggleston in the treatment of clinical cases of myocardial insufficiency would represent about the average lethal dose. The experimental results were in harmony with the recent report of T. Stuart Hart that in four cases of his series of influenzal bronchopneumonia cases heart block resulted from the administration of three drams of tincture of digitalis—about half the dose at which similar effects might be expected in afebrile heart cases. In patients with fever the larger doses of digitalis should be avoided, and the effects of the drug carefully watched throughout the course of the treatment.

Resuscitation of the Heart.—K. Henschen (*Schweizerische medizinische Wochenschrift*, April 1, 1920) reviews the attempts which have been made in the past to effect a resuscitation of the heart after it has ceased to beat through the injection of a stimulant into the pericardium or into one of the cavities of the heart, either with or without the withdrawal of blood or the infusion of a fluid. It appears from his account that a few experiments have succeeded in reviving the heart, at least for a short time, in a number of instances. He reports four cases, which may perhaps be called successful, although in only one did the patient survive. In two patients an injection of one c. c. of adrenalin and 0.5 c. c. of pituitrin into the left ventricle a few minutes after the heart had stopped beating started the heart beat again, but

both died within an hour. In a case of bullet wound of the heart a similar injection revived the heart and the patient seemed to be doing well until a pericarditis proved fatal on the second day. The fourth patient, his second, had suffered a very severe contusion of his chest and upper abdomen. The heart stopped beating during an exploratory laparotomy and could not be revived by massage. One and a half cubic centimetres of a one in one thousand adrenalin solution were injected in the pericardium through the fourth interspace, inside the mammillary line, to a depth of about two cm. The heart then began to beat again, and an intravenous injection was made at once into the arm of 700 c. c. physiological salt solution to which had been added ten drops of adrenalin and 0.5 c. c. of pituitrin. This patient recovered.

Fibromata, with Especial Reference to Radium Treatment.—Everett S. Hicks (*Canadian Medical Association Journal*, July, 1920) states that he has treated ninety-eight cases during the past six years with the following results: Failure, two; all symptoms relieved, tumor largely reduced, twelve; all symptoms relieved, tumor small, seventeen; all symptoms relieved, no appreciable tumor, fifty-three; recent cases, too recent to classify, fourteen. The disadvantages of radium as a treatment are: To the patient, some slight nausea in about five per cent of the cases; to the surgeon, the fear of overlooking a possible carcinoma. The advantages he claims are: Its safety; no loss of patient's time in treatment or convalescence; less expense; patients are in better general health than after operation; radium can be used where operative mortality would be high, as in chronic nephritis, diabetes, severe anemias, heart lesions, or tuberculosis.

Physiological Action of Iodine Fumes.—Luckhardt, Koch, Schroeder, and Weiland (*Journal of Pharmacology and Experimental Therapeutics*, March, 1920) found that iodine deposited on the skin from iodine fumes is absorbed and appears in the urine. The iodine content of the thyroid gland is greatly increased, and there is a pronounced change in the histological features of the gland which clearly indicates absorption of iodine. When iodine fumes are inhaled in the respiratory tract, the excess of iodine appears promptly in the urine and the iodine content of the thyroid gland is invariably increased. Indiscreet use of iodine fumes for inhalation leads to dyspnea, due to an inflammatory reaction in the lungs. When the fumes are inhaled in quantities greater than eighteen milligrams to the kilogram of body weight the animal dies within twenty-four hours from acute pulmonary edema. Intratracheal administration of iodine fumes leads to a temporary moderate rise in blood pressure and an acceleration and increased amplitude of the respiration. Later there occurs a more pronounced fall in the arterial pressure, followed by a partial recovery, and finally, after an interval, a quick drop in arterial pressure, with marked signs and symptoms of pulmonary edema. The respiration ceases while the heart usually shows a decided vagal inhibition. The cause of death is an acute, rapid edema involving chiefly the basal portions of the lungs.

Treatment of Bronchial Fistulæ.—Carl Eggers (*Annals of Surgery*, September, 1920) gives the following conclusions from the results obtained in the treatment of bronchial fistulæ:

1. Bronchopleural fistulæ usually close spontaneously.

2. In the few cases in which a fistula is responsible for the persistence of a chronic empyema, treatment favoring the obliteration of that cavity will result in a closure of the bronchus.

3. Bronchocutaneous fistulæ must be carefully studied and their etiology and the present condition of the lung taken into consideration.

4. As long as the fistula acts as a safety valve for intrapulmonary suppuration, it must not be interfered with.

5. Mobilization of the lung and fistula, allowing it to recede from its fixed position, is the most important factor in bringing about closure.

6. Muscle flaps are valuable to cover the bronchial sinus after the necessary preparation has taken place. They aid in the closure and obviate deformity.

7. Cauterization of the fistula should always be done very slightly, simply to destroy the epithelium, never so deep as to produce a slough.

8. In case the wound is clean, suture of the bronchus should be done.

9. In cases due to lung abscess, in which it is feared that closure of the bronchus may result in damming back of secretions with the danger of pneumonia, the bronchus should not be sutured, but a muscle flap simply laid over it, placing a drainage tube at some distance to act as a safety valve.

10. Whenever possible the operation should be done under local anesthesia.

Specific Treatment of Tuberculosis at High Elevation.—Carl Spengler (*Presse médicale*, April 24, 1920) describes the treatment with the so-called immune bodies as applied in Davos, Switzerland. During one week before the specific treatment is begun hemoglobin is administered to enhance the formation of red blood cells. Iodine with albumen by mouth or inunctions of iothion are also given. For cough and pain codeine or codeine and morphine are given by mouth, and for insomnia due to the tuberculosis poison, hypnotics such as dial, bromural, and adalin until the specific treatment has begun to benefit. The open air cure must be adapted to the individual case. Rest on the steamer chair out of doors is not continued longer than an hour or two morning and afternoon, and in the winter is ordered only on bright, sunny days. By this plan the patients gain much more weight than they do upon the arbitrary open air treatment. Anemic and anorexic patients are not put out of doors at all in the winter season at high altitudes. In cold weather all patients are put in warm beds in their own rooms in the afternoon, with the windows open. Undoubtedly many therapeutic failures at high altitudes are due to excessive open air treatment. The immune bodies or IK are given either hypodermically, by inunction, or by the mouth. One of the chief rules of administration is never to increase the dose where the patient's temperature continues to descend; in contrast to tuberculin therapy, increased

dosage is indicated only when the temperature has become stabilized or has begun to rise again. Tuberculin is dangerous except in the hands of specialists, while the immune bodies may be used by any physician without risk in all cases that are not far advanced. Increased dosage is, furthermore, employed only when local reaction from the previous amount has completely disappeared. Inunctions, when used, are given at weekly intervals, and by mouth the remedy is given two or three times a week; less caution is here required than in the hypodermic method. Excellent analgesic and curative results have been noted upon application of a 0.1 per cent. solution of IK over tuberculous ulcerations; pain and photophobia in ophthalmic involvements are also similarly relieved. Iodine with albumen is particularly indicated in scrofulosis and torpid tuberculosis. In children one or two drops and in adults five or six drops of freshly prepared tincture of iodine, diluted in a cupful of milk, are given at breakfast for two weeks, to be followed by an equal period of rest, and so on. Such medication should be applied *en masse* in schools and among children showing signs of tuberculous heredity or incipient tuberculosis. Iothion inunctions—0.5 to one gram a day—are administered, like mercury, on different surfaces of the body, in fortnightly courses followed by rest for an equal period. By this plan of treatment permanent recoveries are obtained in ninety to 150 days in many cases of tuberculosis not yet too far advanced. Artificial pneumothorax and extrapleural thoracoplasty are indicated only in cases in which specific immunizing therapy has failed, and cannot prove successful unless there is mobilization from the thorax, i. e., collapse of the lung, and also autoimmunization due to the lung collapse. Specific therapy and iodine with albumen should always precede such measures in order to improve the condition of the lung tissues and increase their ability to undergo atelectasis.

Mode of Administration of Antitoxin in Diphtheria.—Weill-Hallé (*Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, January 29, 1920) recommends the intramuscular route as a regular method of antitoxin administration in diphtheria. Injections thus given are better borne than subcutaneous injections, causing none of the sharp and persistent local pain induced by the latter. On the other hand, they are much more easily administered than intravenous injections. The action is more rapid than upon subcutaneous use. Maximum concentration in the blood is obtained in from twenty-four to forty-eight hours, whereas subcutaneous administration yields the maximum concentration only after two or three days. In the majority of cases the dosage used is 250 units to the kilogram of body weight in mild cases and 500 to 600 units in moderately severe and severe cases. A single, massive injection of the entire amount indicated is given. Sometimes the dose is made even slightly larger in order to make good any possible deficiency in the quality of the serum. By this procedure the total amount of antitoxin used is reduced as compared to that employed in the repeated injection method, and the clinical results obtained have been satisfactory.

Miscellany from Home and Foreign Journals

Acute Mania Associated with Plasmodium Vivax Infection.—Haughwout, Lantin, and Fernandez (*Philippine Journal of Science*, December, 1919) report the case of a Filipino, aged nineteen years, who was being experimentally treated with x rays for splenomegaly of malarial origin, and in whom, eight days after the first irradiation, severe mental disturbance occurred and was followed by death after eight more days. Few cases had been previously recorded in which *Plasmodium vivax* infection was associated with cerebral symptoms and death. In this patient the parasites were present in the peripheral circulation in small numbers only and the temperature at no time rose above 39° C.—a point reached a few hours before death. The feces revealed ankylostoma infection. The delirium was preceded for a short time only by restlessness. The eyes then became bloodshot and delirium so noisy and violent that the patient had to be tied in bed. He bit both tongue and lips and spat bloody saliva upon all who came near him. He refused all food and medicine, and his general condition declined very rapidly. Fairly numerous, characteristic trophozoites of *Plasmodium vivax* were found in the peripheral blood. Intramuscular injections of quinine and urea failed to yield any benefit save disappearance of the parasites from the peripheral blood. The patient gave no history of previous attacks of mania and the necropsy failed to disclose any evidence of syphilis. Pais's belief that new generations of the malarial parasite appear to show exalted virulence under the influence of the x rays is offered as a possible explanation of the symptoms in this case. Yet, the parasites never were in the circulation in large numbers and hyperpyrexia never developed.

Acquired Immunity Following Influenza.—Dopter (*Bulletin de l'Académie de médecine*, May 4, 1920) relates that the division to which he was attached in April, 1918, was among the first to be affected by influenza, nearly all the infantry and engineers contracting a mild form of the disease, unaccompanied by pulmonary or other complications. By the close of the month of May the epidemic among these troops had completely ceased. During this time few cases of the disease developed in the field artillery regiment in the same division, but in August it was joined by a group of heavy artillery which brought influenza along with it, and soon the field artillery fell a prey to the infection. At this time the infection was particularly severe in the men who had been spared in the earlier epidemic. Very few of the men previously ill contracted the disease. In the battery most severely involved, the only men remaining healthy were the few who had had the disease in the earlier epidemic. During the severe infection among the artillery, moreover, the infantry and engineers, although necessarily in frequent contact with the artillery regiment, remained unaffected. Finally, about the middle of September, fresh troops joined the division for an attack, all derived from formations

subject at the time to a severe epidemic of influenza. These troops continued to exhibit severe influenzal manifestations in their new assignment, but the original divisional infantry and engineers, who had already gone through the disease in May, remained practically unscathed, only a very few mild cases occurring among them. Recurrences occurred only in the small ratio of 1.6 per cent. These observations constitute important evidence in favor of an acquired immunity following an initial attack of influenza.

Lethal Aspects of Artillery Fire.—R. Mercier (*Bulletin de l'Académie de médecine*, April 20, 1920) presents a statistical study of this question based on five months' continuous observation on three French army fronts during the year 1917. One army, holding a quiet sector, was subjected to the effects of 363,000 German shells—exclusive of gas shells—and suffered casualties of 809 killed and 4,168 wounded, or 0.2 killed and 1.03 wounded per 100 shells. Another army, holding a somewhat more active sector, received 717,000 shells, with 2,753 killed and 10,756 wounded, or 0.38 killed and 1.50 wounded per 100 shells. A third army, in an attacking sector, received 2,529,000 shells, with 9,703 killed and 40,488 wounded, or 0.38 killed and 1.60 wounded per 100 shells. Even during the victorious offensive of this same army, deducting losses due to small arms, the proportion of casualties per 100 German shells was only 0.45 killed and 2.33 wounded. In one of the five test months, account was taken of the different varieties of enemy artillery causing the casualties. During this time four-fifths of the projectiles fired were found to be from the German heavy artillery. The final conclusion reached was that during the summer and fall of 1917 it took 395 German shells to kill and seventy-six shells to wound one French soldier. Knowing the density of the opposed forces and the fact that the French fire was five times as heavy as the German, the French commanders were able to deduce accurately the rate of reduction of the enemy's divisions.

Blood Pressure and the Gallop Rhythm.—A. Amblard (*Presse médicale*, May 1, 1920) discusses in particular the mesosystolic gallop rhythm occurring in infectious diseases, in which the adventitious third sound is mesosystolic in time, and the diastolic or presystolic gallop rhythm noted in patients with combined cardiac and high pressure arterial disease. Concurrent study of the blood pressure and pulse in these cases shows that, however different may be the apparent origin and the classes of cases in which these two forms of gallop rhythm occur, they both set in at a special stage of the disturbance, viz., the moment at which the heart is about to yield. Their appearance is accompanied by a rise in arterial pressure and their disappearance by a reduction in the systolic pressure and the increase of tachycardia necessitated by diminished contractile power of the ventricle. Both types are of considerable prognostic value and afford definite therapeutic indications.

In the mesosystolic gallop rhythm there is no true, continuous arterial hypertension, but instead a weakening of heart action which indicates the use of phosphorus, strychnine, and sparteine. The presystolic gallop rhythm occurs in cases of permanent high tension, and the appropriate therapeutic measures are purgation, diuretics, venesection, and dietetic regulation. In these cases, however, the cardiac insufficiency of which the gallop rhythm is a forerunner must also be combatted through absolute rest in recumbency and digitalis. When intelligently used, digitalis does not raise the blood pressure in hypertension cases. Its administration should be begun as soon as the exercise test brings on an incipient presystolic gallop rhythm perceptible upon auscultation or palpation.

Friedländer Pneuropneumonia with Fetid Rhinitis and Jaundice.—C. Flandin and M. Debray (*Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, January 29, 1920) report the case of a woman, aged forty years, who was suddenly seized with sharp pain in the side and a chill, followed by fever and cough. Pleurisy was suspected, but repeated punctures were negative. On the eleventh day, after defervescence, signs of pneumonia appeared, persisting for over twenty days thereafter. A series of febrile movements gave the case the appearance of subacute illness. There was also ozena from the start, and a varying degree of jaundice. In view of the bloody sputum, infection by the pneumobacillus of Friedländer was suspected, and this was confirmed by microscopic study. The condition is believed to have been a Friedländer septicemia, beginning in the nose, mainly localized in one pulmonary lobe, with extension to the biliary tract, causing infectious jaundice. Recovery took place in one month, in spite of a mitral lesion.

Leptospira Icteroides and Yellow Fever.—Hideyo Noguchi (*Proceedings of the National Academy of Sciences*, March, 1920) notes that in the course of studies conducted in Guayaquil, Ecuador, he was able to detect in certain cases of yellow fever a special spiral organism subsequently termed *Leptospira icteroides*. Guinea pigs and puppies, inoculated with the blood of yellow fever patients or with cultures, present symptoms and lesions closely approximating those of yellow fever in man. The outstanding signs are jaundice, hemorrhage into the lungs and stomach, and albumin and casts in the urine. At autopsy, as in man, the liver, kidneys, and other internal organs are found severely degenerated. The spiral organisms are recoverable from the inoculated guinea pigs, and with them the disease is transmissible through an indefinite series of animals. Furthermore, guinea pigs have been successfully infected with the spiral organisms by means of *Stegomyia* mosquitoes, and *Stegomyias* fed on infected guinea pigs are capable of transmitting the active microbe to still other guinea pigs. Immunological studies indicated the possibility of developing a vaccine and even a curative serum. But until the finding of *Leptospira icteroides* is confirmed by the investigation of cases of yellow fever in still other places, its standing as the inciting agent of yellow fever will have to be regarded as not yet certainly established.

Yellow Fever.—Hideyo Noguchi (*Journal of Experimental Medicine*, February, 1920) used polyvalent immune serum of high potency in treating guinea pigs experimentally infected with *Leptospira icteroides*. When the serum was injected during the time of incubation it prevented further development of the infection. Used in the early stages, it appears to be capable of averting an early termination of the disease, but if it is employed when the guinea pigs are inoculated with a highly virulent culture when the jaundice has existed for some time and the animal is nearing collapse, it is unable to check the course of the infection. Noguchi states that irrespective of the relation which *Leptospira icteroides* may prove to have to the etiology of yellow fever, such patients will probably have little or no chance of deriving benefit from the use of a specific immune serum, when the temperature is subnormal, and the stage of hemorrhages from the gums, nose, stomach, and intestines, with uremia and cholemia, has been reached.

Sulphur Metabolism in the Cancerous Liver.—A. Robin and A. Bournigault (*Bulletin de l'Académie de médecine*, February 24, 1920) found that the least involved portions of the cancerous liver contain about twenty per cent. more of total sulphur than the portions most diseased. These and other estimations tend to show that cancer tissue is built up with much less sulphur than normal liver tissue, and also that the sulphur in the cancerous liver tends to accumulate in the least involved portions of the organ. The ratio of sulphur to dried proteins is much less in cancerous liver tissue than in the uninvolved portions and in normal liver tissue. The accumulation of sulphur in the least involved portions seems to be due to a special mode of disintegration of proteins, this process—preparatory to cancerization—involving the liberation of only certain ones among the aminoacids of the protein molecule in the as yet uninvolved tissues. These special aminoacids are the hexone bases, already found in excessive amounts in cancer tissue by R. A. Kocher, while the sulphur containing cystein remains unaffected. A contrast to this condition is seen in tuberculous tissue in which the sulphur in the least affected portions of the lungs is 16.3 per cent. less than in the most affected portions, and 20.8 per cent. less than in normal lung tissue. Different from the cancer ferment, the tubercle bacillus disintegrates all proteins of the lung tissue, including cystein, and constructs the tuberculous tissue from the débris—another argument against the parasitic theory of cancer. The marked relative increase of sulphuric sulphur, i. e., sulphur oxidized to sulphuric acid, in the most involved portions of the cancerous liver may be considered an indication of a defensive, oxidizing reaction against the noxious aromatic products formed through disintegration of the cancerous tissue. This particular type of defensive reaction does not occur in tuberculous tissue. The study as a whole points to the existence of a dissociating ferment that acts in a special manner upon the proteins of the tissues in which cancer is subsequently to develop. New problems to be solved in the chemotherapy of cancer are thus suggested.

Proceedings of National and Local Societies

AMERICAN ASSOCIATION OF OBSTETRICIANS, GYNECOLOGISTS, AND ABDOMINAL SURGEONS.

Thirty-third Annual Meeting, Held at Atlantic City, N. J., September 20, 21, and 22, 1920.

The President, Dr. GEORGE W. CRILE, in the Chair.

(Continued from page 744.)

Pseudocholecystitis.—Dr. HAROLD D. MEEKER, of New York, drew the following conclusions: 1. The occurrence of adventitious bands in the upper abdomen had been established beyond question. 2. These bands gave rise to definite symptoms. 3. The gallbladder was the viscous most frequently involved; the resulting symptoms simulated a cholecystitis. 4. Plastic surgery had given definite relief. As complete freedom from symptoms had been recorded ten years after operation, it was reasonable to suppose relief might be permanent. 5. It was illogical and unfair to patients to withhold a chance of relief because the origin of these bands might not yet have been definitely established. 6. The frequency with which adventitious bands in other parts of the abdomen coexisted with those of the upper abdomen, emphasized the importance of a thorough search of the entire gastrointestinal tract for abnormal bands and fixed points. 7. It was to be hoped that a comprehensive discussion of these bands would be found in the surgical textbooks of the near future. A knowledge of the condition would be the means of restoring to a life of comfort many individuals otherwise condemned to continued suffering.

Results of Double Flap Low Cæsarean Section.

—Dr. THURSTON SCOTT WELTON, of Brooklyn, N. Y., stated that as a result of the findings in this series of a total of fifty-five cases, he had reached the following conclusions: 1. The double flaps and low incision offered great protection against extension of infection to the peritoneum from an infected uterus. 2. As a result this should be the operation of choice in all potentially infected cases. 3. This fact, also, should extend the field for Cæsarean section to include such patients as had been long in labor with the membranes ruptured and potentially infected from frequent vaginal manipulation in which most men would elect to do a craniotomy on a living child rather than do a classical section. 4. The double flaps, likewise, so completely peritonealized the uterine wound that adhesions and postoperative disturbances were greatly minimized. 5. From the results obtained and the reasons given, the two flap low Cæsarean section should be the operation of choice even in elective cases.

A Preliminary Report of Pyelitis in Pregnancy with Report of Cases.—Dr. GREER BAUGHMAN, of Richmond, Va., reported three cases of pyelitis complicating pregnancy. He showed lantern slides and charts and pyelograms indicating the progress of the cases. All the patients were treated with pelvic lavage. Living babies were born to the two

patients in whom labor was induced at a selected time, while in the patient who entered labor before the time set for the induction of labor, the child died. With the exception of a few treatments, the patients after the first reaction showed marked improvement in symptoms. In all the patients the right pelvis was primarily involved; in two the bladder was involved early, in the other the bladder signs were not prominent. Bacillus coli was the exciting cause of two; staphylococcus albus of the other. In all the cases the curve representing the right and left pelvic sizes were parallel. A marked improvement was noted in all symptoms, pelvic size, and urinary findings following delivery, showing that the obstruction did take place from the uterus and its contents. It was found possible to irrigate all of these patients within two weeks after the time of their delivery; in none was there any rise in temperature during the puerperium.

Borderline Carcinoma of the Cervix and Its Treatment.—Dr. EDWARD A. WEISS, of Pittsburgh, Pa., said that when a diagnosis of cancer of the cervix had been made, appropriate treatment should be given at the earliest possible moment, nevertheless haste in operating was not always advisable. He had found from practical experience that preliminary preoperative rest in bed for several days resulted in a marked diminution in the size of the diseased cervix, but more important still there was often noticed a decided decrease in the thickening and fixation of the broad ligaments, proving that the fixation was inflammatory rather than a malignant invasion of the lymphatics of the broad ligaments. As a result of this observation he had frequently found that the supposedly inoperable case was really operable or borderline. During the period of rest in bed, more careful study of the patient's resistance could be made, and should radical treatment follow, the condition of the patient was greatly improved and offered a better operative risk.

In the borderline cases, the improved Byrne cautery technic, which was practically the first stage of the Werder radical igniextirpation, had given him the best results in many years, and while only a few so-called permanent or five year cures were obtained, yet he had had several instances of complete freedom from symptoms for periods of from three to five years. In thirty-eight borderline cases so treated, there was recurrence with death in one case at six months; two in nine months; five in twelve months; five in eighteen months; eight in two years; five in two and a half years; two in three years; three in three and a half years; two in four years; one in five years, and four were not to be traced after the first year. In this series one death resulted on the fourth day from embolism.

The results obtained by Dr. Weiss with radium in a series of advanced or inoperable cases were so striking, that a series of forty-five borderline or Group IV. cases, radium instead of the cautery was used, and while the results were disappointing

in some instances, he was forced to admit, after taking all factors into consideration, that in a small series radium had proved to be a most valuable adjunct, both as to immediate and remote results. To say that radium used in the cervix was a harmless procedure was not in accordance with facts and its indiscriminate use would bring discredit to a very valuable adjunct in gynecological therapy. In using the cautery in the treatment of borderline cancer, a clear distinction must be made between the so-called Percy cauterization and high amputation by the cautery. In the former the cervix was not removed, but a deep charring resulted which was often followed by fistula formation and severe constitutional reaction. The subsequent use of radium would not only be of little value, but would increase the tendency to fistula. Cancer of the cervix was still to be classed as an operative condition when discovered early and the patient a good risk. When a doubtful borderline condition was presented treatment by radium was advisable and the question of subsequent operation should be decided by the reaction obtained; but if the operation was contraindicated by age, general condition, heart, kidney, or blood vessels, radium alone should be used.

Splenic Leucemia Associated with Pregnancy.

—Dr. GEORGE W. KOSMAK, of New York, stated that a survey of the reported cases of leucemia complicating pregnancy in which a fairly definite diagnosis from the blood picture was made, disclosed a total of twelve, including two of his cases. The ages of the patient varied from twenty-four to forty, the majority being between thirty-two and thirty-six. With the exception of Peterson's case all were multiparæ. A possible hereditary history was mentioned in only one case. The parity varied from three to nine. In most of the cases he got a history of living children that showed no tendency to the disease up to the time of the report, but in a few instances he was told that the babies died at varying periods after labor, from a few days to five months. In four cases mention was made of the birth of macerated or stillborn fetuses. Among these twelve cases the mother survived in but two, but how long these mothers lived was not stated, nor the subsequent course of the disease. In the majority of cases he found that the woman survived, but a short time after labor. One of his patients died before delivery took place. In Peterson's case, death came on an hour after labor, in Hilbert's case, ten hours, and in Laubenburg's, forty hours after labor. There was a record of death in Stillman's case one month after delivery, in his second case death occurred in two weeks, and in Jaggard's case in eleven months after delivery. In every instance but one (his own case), in which the definite diagnosis was presented the splenomedullary type of the disease was observed. It would be noted that in many cases the authors mentioned a prodromal period in which progressive emaciation, anemia and loss of strength were noted soon after a pregnancy, from which no recovery resulted, and during which period the woman again became pregnant. The leucemia itself did not, therefore, appear to be a deterrent factor to conception.

Although the presence of a true leucemia as a complication of pregnancy was from all available records a very rare condition, nevertheless, one ought to be on his guard against it. Probably a considerable number of cases of marked anemia in which no satisfactory blood count had been made might have been true instances of this disease. In any case where an anemic patient failed to recover under proper treatment, a more minute and detailed examination of her blood should be made with reference to the possible diagnosis of leucemia. The occurrence of pregnancy in this disease indicated a most unfavorable outlook for the mother and conception must therefore not be allowed to take place where the condition was suspected. The prognosis was undoubtedly worse in the pregnant than in the nonpregnant and whether the association was accidental or not was immaterial. Where the disease was already present abortion seemed to be the rule, with a rapidly progressing course and a fatal issue. The presence of an enlarged spleen was an almost constant factor in the disease and should lead one to look for this sign in every anemic patient. The value of the x rays in leucemia had been brought forward, but in the event of a pregnancy its application, as a cure for the disease, might work an undoubted harm on the fetus and the induction of labor should be done before radiation was begun.

It was necessary to distinguish between the acute and chronic forms of leucemia. Pregnant women might contract a rapidly fatal leucemia if the evidence of the cases thus far reported, was to be believed, although it seemed possible that the disease was present in a milder form in many of these patients before their last and usually fatal pregnancy occurred. It would be noted that there were apparently, cases of chronic leucemia in this series in which pregnancy and labor occurred, and for this reason conservative treatment had been advised under such circumstances. In view of the rapidly fatal ending during the puerperium it would appear that this advice was not justifiable and that in order to avoid such an outcome labor had better be induced in all cases.

Benign Mammary Tumors and Interstitial Toxemia.—Dr. WILLIAM SEAMAN BAINBRIDGE, of New York, reported a series of twenty-five cases of abnormal mammary changes apparently caused by autointoxication. Each of the patients who suffered from abnormal breast conditions had in addition to the breast changes, coexistent chronic intestinal toxemia, the mammary gland frequently registering the degree of toxic poisoning. He divided the cases roughly into three classes: 1. Patients with a condensation or lobulated induration of the upper, outer quadrant of the breasts, usually along the edge of the large pectoral muscle and where the dependent breast dragged on the upper axillary margin. These were lumpy, toxic, or stasis breasts. 2. Patients with breast changes as in Class I but with the added condition of localized degeneration of the mammary gland, such as adenomata or cysts. 3. Patients with breast changes as in Classes I or II and in conjunction an abnormal discharge from the nipples.

The majority of the cases were in patients with marked intestinal toxemia; a few had complicating pelvic conditions. 1. Patients cured with medical measures, five; patients cured by surgical relief of the chronic intestinal stasis and without operation on the mammae, fifteen; patients cured after operation for adenoma or cystoma and for the intestinal stasis, the remaining indurated, lobulated portion of the breast returning to a normal condition, one; patients cured by the removal of an adenoma or cystoma from a toxic breast, and by preliminary and aftertreatment for the intestinal toxemia, three, and patients from which stasis breasts were removed, the underlying intestinal toxemia not being recognized, one. Dr. Bainbridge presented the following conclusions: 1. There are definite abnormal conditions of the breast tissue due to intestinal toxemia. As the thyroid gland is changed by toxemia, so the mammary gland may be altered completely by chronic intestinal stasis. 2. Under medical treatment an appreciable number of these patients with abnormal breast conditions are cured. A proper uplifting abdominal corset applied for enteroptosis, a careful diet, catharsis, breast supports for dependent organs, digestants, intestinal antiseptics, and certain physiotherapeutic agents are among the corrective measures which often cause even well defined tumors of the breast to disappear. Any element which tends to diminish the gastrointestinal fermentation is of value. A preliminary lessening of the general toxic condition of the patient materially aids the surgeon in determining the true benign neoplasm and saves a considerable amount of recoverable breast tissue too often unnecessarily sacrificed. 3. Surgical procedures frequently are required for the correction of the intestinal stasis and the removal of the cystoma or the adenoma before the indurated, lobulated tissue resumes a healthy gland condition and the breast is brought back to normal. 4. When these toxic cases are seen early the beginning changes in the breast are often overlooked, or, when the condition is well developed, the incorrect diagnosis of malignancy is made. One question naturally forces itself upon the profession in this connection: Would an early recognition of the toxic breast and the timely and efficient treatment of the underlying cause tend to lessen the danger of malignant degeneration of the mammary gland and thereby render unnecessary much of the mutilation of the human breast?

Cases of Thrombophlebitis During the Puerperium Following Influenza.—Dr. LEWIS F. SMEAD, of Toledo, Ohio, said that the present interest in septic, puerperal, pelvic thrombophlebitis dated from a paper by Trendelenburg in 1902. The condition was not infrequent in the puerperium, because of the slowed blood current and the opportunities for infection. The disease consisted usually of a streptococcus infection, entering, as a rule, through the placental site, extending by the ovarian and uterine veins, and resulting in pyemia and death in about fifty per cent. of the cases. The acute cases were rapidly fatal, but in the subacute cases the prognosis was better. The disease was marked by a sudden fluctuating temperature, severe chills, a relatively low pulse rate, and a prolonged course

of the disease. A sharply defined, painless, slightly tender, cordlike induration in the region of the pelvic veins could be made out sooner or later. The results of the blood cultures were uncertain. A striking feature was the surprisingly good condition of the patient between the rigors.

The diagnosis of pelvic thrombophlebitis was fairly accurate. Differentiation must be made from septicemia, pelvic lymphangitis, uterine infection, and thrombophlebitis in other vessels. The operative mortality was undoubtedly somewhat lower than the nonoperative. The indications for operation were hard to define, but in cases with septicemia, metastatic foci, and vena cava involvement, operation was not impossible. Prophylaxis consisted of intelligent obstetrics, careful asepsis, complete evacuation of the uterus, and good drainage, with a minimum amount of traumatism and hemorrhage. The circulation in the puerperium was kept active by good food, fresh air, early rising, and heart stimulation if necessary.

The nonsurgical treatment consisted of general supportive measures with the avoidance of anything which might dislodge a thrombus, such as, douches, enemata, and pelvic examinations. Vaccine and serum treatment had been disappointing. The surgical treatment consisted in the ligation or excision of the involved veins by the transabdominal route and by the drainage of perivascular abscesses. Opinion upon the question of surgical intervention in pelvic thrombophlebitis was still divided, but all agreed that great conservatism must govern the choice of cases and the decision for operation.

Fibroma of the Ovary.—Dr. EDMUND D. CLARK and WILLIAM E. GABE, of Indianapolis, Ind., presented the following conclusions: 1. Ovarian fibromata are sufficiently rare to warrant their report in all carefully studied cases. 2. The diagnosis is dependent solely on microscopic examination. 3. In the presence of a hard, unilateral, movable tumor with ascites, where the more common causes of ascites can be ruled out, ovarian fibroma is highly probable. 4. The treatment is operation; the prognosis good. 5. The gross pathology of the condition is extremely variable; the microscopic pathology, as pointed out by Hellman, must show regularity of the individual fibres or muscular cells and strands, despite varying quantities of cells, fibres, vessels and degenerative changes.

Indications for Hysterectomy.—Dr. JAMES F. BALDWIN, of Columbus, Ohio, states that very many women suffered from chronic uterine hyperplasia, frequently complicated with laceration of the cervix, retroversion, a tendency to procidentia, with leucorrhœa, dyspareunia, sterility, backache, and general ill health. In this type of disease no treatment effected a cure, and little could be accomplished in palliation. Other women suffered from imperfect development of the uterus, with sterility, painful menstruation and other disturbances. The paper was a plea for the radical cure of these two classes of cases by hysterectomy, but with saving of appendages so as to obviate the symptoms of the menopause, except as to the absence of menstruation.

(To be concluded.)

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THE UNCONSCIOUS.

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The concept of the unconscious in psychology is one which has aroused the liveliest differences of opinion and has been met by bitter opposition. Even those who are ready to accept the vast influence of unconscious factors in psychology may well be appalled by the difficulties of treating the unconscious in a scientific manner and fitting so necessarily hypothetical a factor into the explanation of behavior. One line of opposition has come from advocates of the older introspective school of psychologists who have found it difficult to fit an unconscious region of the mind into their schemes of description and explanation. The aim of the older psychology was to furnish a rational explanation of human behavior and endeavor. As the material for such explanation they used almost exclusively the happenings in their own minds which could be directly, though really only retrospectively, observed, and made this material the basis of constructions whereby they fitted into coherent schemes the infinitely varied experience of the human mind. When their introspective method failed them, and they were driven to assume the existence of factors lying outside those accessible to introspection, they were accustomed to assume subconscious processes or to speak of psychological dispositions and tendencies, or they would even throw psychology wholly aside, bringing into their schemes of explanation factors belonging to the wholly different order of the material world, and used physiological processes as links in the chain whereby they connected one psychological happening with another.

It is noteworthy that the due recognition of the importance of the unconscious and the first comprehensive attempt to formulate a scheme of its organization and of the mechanisms by which it is brought into relation with the conscious, should have come from those whose business it is to deal with the morbid aspect of the human mind. The necessity for the use of unconscious factors continually arises when dealing with the experience of health, but the opportunities afforded by such experience are usually so fleeting, and the experience itself often so apparently trivial, that they failed to force the psychologists of the normal to face the situation. It was only when unconscious experience had contributed to wreck a life or produce a

state with which the physician had to struggle, and then often ineffectually, for months or years, that it became impossible to push such experience aside or take any other line than that involved in the full recognition of its existence. It is only the urgent and inevitable needs of the sick that have driven the physician into the full recognition of the unconscious, while it has needed the vast scale on which nervous and mental disorders have been produced in the war to force this recognition upon more than the few specialists to whom it had been previously confined.

In entering upon an attempt to make clear the sense in which the term unconscious should be used, I will begin by pointing out one sense in which it will not be used. At any given moment we are only clearly conscious of the experience which is in the focus of attention. This forms only an infinitesimal proportion of the experience which is capable, by being brought into the focus of attention, of becoming conscious with an equal degree of clearness. Again, at any one moment a much larger amount of experience is within the region of the conscious though less clearly, but even the largest amount which can thus be brought within the outermost fringe of consciousness at any instant or even within any brief space of time, forms but a very small proportion of that which, with other directions of the attention, could come into the field of consciousness. At any given instant there is a vast body of experience which is not in consciousness only because at that instant it is neither the object of attention nor so connected therewith as to occupy consciousness with more or less clearness at the same time. Experience of this kind will not be included within the unconscious as I shall use the term. In so far as the term the unconscious applies to experience it will be limited to such as is not capable of being brought into the field of consciousness by any of the ordinary processes of memory or association, but can only be recalled under certain special conditions, such as sleep, hypnotism, the method of free association, and certain pathological states.

A good instance of the unconscious is afforded by the conditions underlying the claustrophobia of a sufferer from war neurosis. For as long as he could remember this patient had been subject to a dread of confined spaces so severe and producing states so painful and unendurable that he was debarred from taking part in many of the ordinary

occupations of life, or could do so only at the risk of suffering and discomfort. When I first saw him his earliest memory of the dread went back to the time when at the age of six he slept with his elder brother in what is known in Scotland as a box bed. The bed stood in a recess with doors which could be closed so as to give the appearance of a sitting room. The child slept on the inner side of the bed next to the wall, and he still vividly remembers his fear and the desire to get out of bed, which he did not satisfy for fear of waking his brother. He would lie in a state of terror, wondering if he would be able to get out if the need arose.

The next memory bearing on his phobia is of being taken to see some men descending the shaft of a coal pit. There came to him at once the fear that were he going down something might happen to prevent his getting out. Whenever he was taken in childhood for a journey by train he dreaded the tunnels, and if by chance the train stopped in a tunnel he feared that there might be an accident and that he would not be able to get out. This fear of tunnels became worse as he grew older. When he began to go to the theatre or other crowded building he was always troubled unless he was near the door, and he was never happy unless he could see a clear and speedy mode of exit. He would not travel by the tube railway, and vividly remembers his horror when on one occasion he had to do so. As long as he can recollect he has felt an intense sympathy whenever he has read of prisoners being confined in a narrow cell, and he has always been greatly disturbed by tales of burial alive.

When during the war he went to France as a doctor, he was greatly disturbed by having to live and work in dugouts and would seek excuses to go to the trenches in order to escape from experiences which were to him far more trying than the dangers of the front line. As a result of the strain he broke down and some time later came under my care. In obtaining his history I found that he had been through a course of psychoanalysis of a very crude kind and had for years been seeking some event of childhood which could explain his dreads. We then started on a new attempt in this direction. I asked him to remember as fully as possible his dreams and to record any memories which came into his mind while thinking over the dreams. A few days later he related a dream which I do not purpose to consider here, because it does not directly concern the claustrophobia. Its interest from the present point of view is that in thinking over the dream there had come into his mind an incident going back to the age of six which had, so far as he knew, gone completely out of his mind for many years. Taking the dream and memory as a starting point, he was led on to recall two other incidents of this time, one of which seemed to be definitely related to the dream. All three incidents had been completely forgotten till recalled on this occasion, though they were all associated with a strong emotional tone and had affected him greatly at the time. None of them seemed to have any relation to the claustrophobia, but they were very useful in demonstrating to the patient the value of analyzing dreams, and in showing him that the method, if

persevered in, might lead to something more obviously related to his symptoms.

Three nights later he had another dream. As he lay in bed thinking over the dream, there came into his mind an incident dating back to three or four years of age which had so greatly affected him at the time that it now seemed to the patient almost incredible that it could ever have gone out of his mind, and yet it had so completely gone from his manifest memory that all his attempts at analysis prolonged over years had failed to resuscitate it. The incident was of a kind which convinced him at once that the long sought memory had been found.

The incident which he remembered was a visit to an old rag and bone merchant who lived near the house which his parents then occupied. This old man was in the habit of giving boys a small reward when they took to him anything of value. The child had found something and had taken it alone to the house of the old man. He had been admitted through a dark narrow passage, from which he entered the house by a turning about half way along the passage. At the end of the passage was a brown spaniel. Having received his reward the child came out alone to find the door shut. He was too small to open the door, and the dog at the other end of the passage began to growl. The child was terrified. His state of terror came back to him vividly as the incident returned to his mind after all the years of oblivion in which it had lain.

Ten days later the patient dreamed that he visited Edinburgh for the purpose of taking the diploma in psychological medicine. As he lay in bed thinking over his dream and its possible antecedents, he found that he was saying to himself over and over again the name "McCann." He could not at first remember that he knew anyone so called, but it suddenly flashed on his mind that it was the name of the old rag and bone merchant in whose house he had been terrified.

One thing was needed to make the story complete. It seemed possible that these thoughts, recalled in consequence of thinking over dreams, might be purely fictitious. It might be that in his intense desire to find some experience of childhood which would explain his dread the patient might have dreamed, or thought of, purely imaginary incidents which had been mistaken for real memories. Luckily the patient's parents are still alive, and on inquiry from them it was learned that an old rag and bone merchant had lived in the neighborhood in such a house as the patient remembered and that his name was McCann. Until they were told some twenty-seven years later they had no idea that their child knew anything of the old man or had ever entered his house.

The recovery of his long forgotten fright was followed by a remarkable improvement in his specific dread. A few days after recalling the memory he sat without disturbance in the middle of a crowded moving picture house under conditions which for years before would have given him the most serious discomfort and dread. The patient was so confident that he wished me to lock him in some subterranean chamber of the hospital, but I need hardly say that I declined to put him to

any such heroic test. He has since traveled in the tube railway with no discomfort whatever, so that the ordinary conditions which had brought his phobia into activity for many years no longer have this effect. He has even been down a coal mine, which was especially the object of his former dread, and went more than a mile along narrow passages beneath the ground, the mere thought of which would once have made him shrink in horror. A striking sequel of the recovery of his infantile memory is that terrifying dreams of being unable to escape from enclosed spaces from which he formerly suffered now trouble him no longer, and he had a dream in which he found himself in a narrow cell in the company of a bloodhound, and was amazed in the dream that he should be so happy and comfortable in this situation. We have here a typical example of the kind of experience I have in mind when I speak of the unconscious. We have no direct evidence that the incident has been wholly unconscious during childhood, but owing to his prolonged search for such experience at a later period of life, and its total failure to appear in consciousness, we have the most decisive evidence that an arresting experience, one accompanied by an emotional state of the most poignant kind, can lie dormant and evade the most searching attempts to bring it into the field of consciousness. When it was at last brought to consciousness, this did not happen through any association of waking life but came in the semiwaking state following a dream. Its coming to consciousness occurred in definite connection with an experience of sleep which we know to furnish conditions especially favorable to emergence from the unconscious.

This patient not only affords conclusive evidence for the existence of experience shut off from consciousness under ordinary conditions, but his case shows that this experience, though inaccessible to consciousness directly, may yet be capable of affecting it indirectly. His dread of confined spaces had so definite a relation to the early experience that the two were undoubtedly connected, while the complete disappearance of his claustrophobia after bringing the long dormant experience to the surface affords further, though standing alone not necessarily conclusive, evidence in the same direction.

Psychological literature contains many similar histories. I take this case of claustrophobia as an example, partly because, having come under my own notice, I am able to estimate its trustworthiness. Still more important is the fact that it was possible to obtain conclusive evidence that the infantile experience had really occurred, and was neither the fancy of the patient nor the result of suggestion on the part of the physician, the latter possibility being especially present when a supposed experience of childhood is discovered by means of hypnotism.

The records of others can never, however, carry the conviction which comes from one's own experience, even though such experience can rarely have the dramatic and conclusive character of that I have just cited. One who wishes to satisfy himself whether or no unconscious experience exists should

subject his own life history to the severest scrutiny, either aided by another in a course of psychoanalysis or, though less satisfactory and less likely to convince, by a process of selfanalysis. It will perhaps be instructive if I give a result of my own selfanalysis, which though at present incomplete, has done much to convince me of the reality of the unconscious.

I am one of those persons whose normal waking life is almost wholly free from sensory imagery, either visual, auditory, tactile or of any other kind. Through the experience of dreams, of the half waking, half sleeping state, and of slight delirium in fever, I am quite familiar with imagery, especially of a visual kind, which, so far as I can tell, corresponds with that of the normal experience of others. I am able to recognize also that in the fully waking state I have imagery of the same order, but in general it is so faint and fragmentary that the closest scrutiny is required for its detection. It is clear to me that if it were not for my special knowledge and interest I should be wholly ignorant of its existence. On looking back in my life I am aware that my mental imagery was more definite in youth, and I can remember the presence at that period of fairly vivid visual imagery in connection with certain kinds of experience, especially of an emotional kind.

Some years ago, as part of an examination into my memories of childhood, I discovered that I had a more definite knowledge of the topography of the house I left at the age of five than of any of the many houses I have lived in since. I can make a plan of that house far more detailed, based on memories clearer to myself, than I can make of houses in which I have lived far longer and at times of life when one might expect more permanent and vivid memories. Moreover, I can even now obtain visual images of the early house more clear and definite than any I usually experience, while other memories of my first five years of life bring with them imagery more definite than accompany the memories of later years. I have concluded that before the age of five my visual imagery was far more definite than it became later and was probably as good as that of the average child.

For some time I explained the loss of imagery of which I am the subject as part of a process by which I had become especially interested in the abstract. I supposed that my imagery had faded for lack of the attention and interest which would have kept it active, even if it had not promoted its development into the instrument which imagery has become in the mental life of the majority of human beings. It is only during the last year or two that I have discovered an aspect of my early experience which has led me to revise this earlier opinion. This discovery is that my knowledge of the house I left when five years old is strictly limited to certain parts of it and that the rest is even more inaccessible to memory than any of the houses in which I have lived since. So far as I remember the house had three floors. I can remember, and even now image fairly vividly, every room, passage and doorway of the ground floor. I can in imagination

go down stairs into a kitchen in a basement and I can go upstairs toward the upper floor, but when I reach the top of the stairs I come to the absolutely unknown, an unknown far more complete than is the case with any house occupied more recently, where I have some idea of the topography though this is inexact and vague. For more than a year I have been attempting, by means which have succeeded in evoking other early experience, to penetrate into the mysterious unknown of the upper story. Though I have recalled many incidents of my early life which took place on the ground floor, in the basement, in the regions before and behind the house, no event of any kind which happened in the upper story has ever come to my consciousness. Now and then, when in the half waking, half sleeping state peculiarly favorable in my experience to the recovery of long forgotten events, I have had the sense that something is there, lying very near emergence into consciousness. But I have not yet succeeded in penetrating the veil which separates me from all knowledge of my life in that upper story.

The evidence for the existence of unconscious experience which is provided by these memories of my infancy is, of course, incomplete in that I have not yet discovered the nature of the unconscious experience and have even no certain guarantee that it exists. The feature of the experience which impresses me—I cannot expect it to have an equal influence on others—is the completeness of the blank in my mind in connection with that upper story. I fail to explain that blank by any mechanism provided by differences in affect or interest on memory. A psychologist of the old school would probably say that we tend especially to remember the striking and unusual, and that it is therefore natural that my memories of the upper story, where I probably passed most of my life at that time, should be less vivid than those of the lower parts of the house which I visited less often. This might well explain a different degree of distinctness of memory, but it cannot explain the completeness of the blank left by the memories of the upper story. Another line which might be taken is that at any rate during the year before I left the house, I lived on the ground floor during the day and only visited the upper floor at night when tired. But even if such a reason were valid, it cannot explain the completeness of the blank. Moreover, such explanations seem to be put out of court by the fact that when I recall memories of houses lived in later, I find no such difference between upper and lower stories. Though my memories of later houses are more vague than the early memory, they are quite as definite for the upper as for the lower parts of the buildings.

The two cases I have described as examples of the experience of early life which has become inaccessible to consciousness. This period of life is especially likely to afford occasions for experiences to become unconscious, but the passing of experience into the unconscious may happen at any age, and its occurrence has been brought to notice very widely by the experience of war. One of the most frequent features of the nervous disturbances

of war has been the complete blotting out of the memories of certain events, the obliteration usually extending considerably beyond the event which furnished its special occasion. In some cases, where the loss of memory for a period of the soldier's life has been produced by physical shock accompanied by complete unconsciousness, as in cerebral concussion, the obliteration has been complete and the case does not come within the scope of the present subject, for there is no evidence that any experience exists capable of being again brought to consciousness. In many cases, however, in which the obliteration is due to mental shock or other psychical factors, the experience which is inaccessible to the consciousness of the subject under the usual conditions of memory has been recovered in the hypnotic state or by the method of free association or has expressed itself, usually in a distorted form, in dreams. In such cases soldiers have lost the entire memory of their lives from some moment preceding a shock or severe strain until they have found themselves in hospital, perhaps weeks later, although during at least part of the intervening time they may have been to all appearance fully conscious and may even have distinguished themselves by actions on the field of which they have no recollection. Although these memories may remain for months or years quite inaccessible to memory when approached by the ordinary channels, they may be brought to the surface by means of hypnosis or by the method of free association.

In a case of a somewhat different kind under my care a soldier had lost all memory of his life from a day in July when he was training in England until the following January when he found himself in hospital in Egypt, having no recollection whatever of his service in various parts of England, of the voyage to Egypt, or of his life in Egypt before going to hospital. The memory of this period was not recovered until more than a year later following the disclosure of a painful experience in his life which had a definite connection with his amnesia.

In cases such as these the loss of memory forms part of the complex group of changes which make up the state we call psychoneurosis. There is reason to believe that many of the manifestations or symptoms of this state are due to the activity of the experience which has become unconscious just as the dread of my claustrophobic patient has been ascribed to the unconscious experience of which he was the subject at the age of four. The effects which can be thus ascribed, at any rate in part, to the unconscious experience of war fall into two main groups. There are, on the one hand, general changes in personality, and changes in tastes, in likes and dislikes, in preferences and prejudices, while on the other hand, there are specific dreads or other morbid experiences of waking or sleeping life, such as nightmares, hallucinations or morbid impulses, which can be more or less directly ascribed to the activity of the unconscious experience. In such cases we have definite evidence, not merely for the existence of unconscious experience, but for its activity, or capacity for activity, in this unconscious state.

I have now attempted to make clear the sense in which we should speak of the unconscious. I have illustrated its nature by means of three kinds of example; one taken from a definitely pathological state dependent on an experience of early life; the second derived from my own history, also derived from the unconscious experience of early life, but one which may be regarded as coming within the limits of normal psychology; while the others are taken from cases of psychoneurosis in which the experience which has become unconscious is made up of the events and memories of warfare. I have now to consider how such experience becomes unconscious. I shall speak of this process as suppression. Writers on the unconscious often use repression for the process in question, but I propose to reserve this term for the process by which we wittingly endeavor to banish experience from consciousness. It seems that this process of witting repression may be one means of producing suppression, that experience wittingly repressed may, at any rate under certain conditions succeed in becoming inaccessible to the general body of consciousness. But there is little doubt that this is only one of the ways in which suppression occurs, and that more often it takes place wholly without the intervention of volition, especially when it occurs as the result of some physical or mental shock.

We are still in much uncertainty concerning the exact mechanism by which suppression occurs, but there is reason to believe that in the majority of cases it takes place without conscious effort, or according to the terminology I propose to use, unwittingly. There is even some reason to believe that suppression only follows witting repression, when conditions of some other kind favorable to suppression are present.

I propose now to compare suppression with the ordinary process of forgetting. Suppression is only one form of forgetting—a form in which the forgetting is especially complete—and light should be thrown upon the nature of suppression by a general study of the process by which we forget. Formerly psychologists were especially concerned with the process by which we remember, but they have gradually been coming to recognize that the more important problem is to discover how and why we forget. It is one of the many merits of Freud that he has thrown much light on this problem and with a wealth of examples has illustrated the complex nature of forgetting in the ordinary course of daily life. According to him forgetting is not a passive process, dependent on lack of interest and meaning, or varying with the intensity of an impression, but is an active process in which some part of the mental content is suppressed. The content which is thus suppressed does not disappear because it is uninteresting or unimportant; on the contrary, it is usually of very special interest and has a very definite meaning. It is suppressed because the interest and meaning are of a kind which arouse pain or discomfort and, if present in consciousness, would set up activities which would be painful or uncomfortable. Active forgetting is thus a protective process, one by which conscious-

ness is protected from influences which would interfere with the harmony essential to pleasure or comfort.

The examples of the unconscious which I have given are only pronounced examples of a similar process. Just as we tend to forget an appointment which seems likely to be the occasion of a quarrel or may forget to write a letter which involves the undertaking of an unpleasant responsibility, so we may suppose that the painful experience of my claustrophobic patient was forgotten because the memories of the passage and the dog were so painful as to interfere with his happiness. The completeness of the suppression may have been due to the fact that the interference with the comfort of the child was so great as seriously to disturb his health. In the case of my own experience it is not possible to say why the memory of the upper floor has been forgotten, since I do not yet know the nature of the suppressed experience, but we can be fairly confident that it was of an unpleasant kind and was forgotten because the memory of it interfered with my comfort and happiness.

The memories which disappear in warfare are always of happenings so distressing that the utmost pain is aroused when they reappear in consciousness. The conclusion to which we are led both by the experience of everyday life and by the analysis of pathological and semipathological states is that there is no difference in nature between the forgetting of the unpleasant experience of ordinary life, often quite trivial in character, and such examples of complete and life long suppression as those which I have chosen to illustrate the nature of the unconscious.

If these two kinds of forgetting are essentially alike, if they furnish the two ends of a continuous series, a study of the forgetting of everyday life should provide a means of studying the suppression which occurs in pathological states. If we attempt such a study the first point which may be noticed is that the active forgetting of everyday life is not voluntary and intentional, but is essentially a process which takes place unwittingly. If we try to forget an appointment which we expect to lead to a quarrel or try to forget a letter undertaking an unpleasant responsibility, we should not succeed. We should probably only fix these duties the more firmly in our memories. It is characteristic of the active forgetting of which Freud (1) has provided such a wealth of examples that it occurs spontaneously. In such instances as I have given, we do not know that we have forgotten. It is only when we are reminded of the missed appointment or the overdue letter that we become aware of the lapse. In other cases, as when we forget the name or address of a correspondent to whom we should write, we know that we have forgotten, but the act of forgetting has still been involuntary and unwitting.

The pathological suppression taking place in adult life seems in most cases to be clearly involuntary and unwitting. The most complete cases of suppression do not occur in people who have tried consciously to repress painful experience, but has

come about without any conscious activity on the part of the sufferer, especially as the result of shock or illness. Hypnotism furnishes a striking example of the process by which experience is suppressed. By means of suggestion given in the hypnotic state any experience, pleasant or painful, which occurs during this state may be banished from the memory. When this has been done the hypnotized person is quite unable to recall the experience, and it will remain unconscious until he is again hypnotized or until the experience is recalled under some other condition in which unconscious suppressed experience comes to the surface. In this case the suppression takes place quite independently of the will of the hypnotized person, but there is reason to believe that the suggestion to forget is more likely to be successful, the more the forgetting is in consonance with the conscious wishes of the subject. This probably gives the clue to the fact that conscious repression seems often to lead to suppression. The suppression itself is unwitting, but the wish of the sufferer for suppression assists the process, or at least helps in its maintenance and completeness.

I must now consider briefly a characteristic of active forgetting and suppression which is of great importance in understanding its nature. The experience which tends to be forgotten or repressed is the immediately painful. If we forget an appointment or a letter in connection with which we anticipate unpleasant emotions, the ultimate consequences may be even more unpleasant than the immediate experience from which we escape by the act of forgetting. If we were able to consider rationally the consequences of the lapse, we should find that in most cases the course which would give us least trouble and inconvenience in the long run would be to keep the appointment or write the letter.

The process of active forgetting, however, takes no account of these ultimate consequences, but is directed exclusively towards the avoidance of the more immediate pains and discomforts. The same seems to be true of cases of pathological suppression. If, as I suppose, the claustrophobia of my patient was the result of the suppression of his four year old experience, there can be little doubt that the sum total of unhappiness due to his dreads was far greater than that which would have resulted from the immediate memories of his terror when in the passage with the dog. The memory was suppressed because of its immediately painful character, and in following this course Nature took no account of the effects of the suppression, which were to torment the child and man for thirty years. The suppressions which form so large an element in the neuroses of war are also directed to allow escape from the immediately unpleasant, regardless of the future consequences. Suppression is a process of reaction to pleasures and pains which are immediately present and takes no account of the more extended experience with which it is the function of intelligence to deal.

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A NEW PSYCHOANALYTICAL THEORY.

Kempf's Dynamic Mechanism.

BY ANDRÉ TRIDON,
New York.

Valuable as their theories are, one cannot help feeling that Freud's and Jung's mode of thinking is still closely related to that of the academic psychologists. They give the impression that the mental and the physical are two separate entities. The term conversion used by Freud to designate the physical symptoms accompanying certain emotions seems to imply a duality in organic manifestations which, to modern scientists, appears unfounded. When Freud and Jung speak of libido, cravings, and censor, they are almost as vague and unconvincing as Bergson when he speaks of the vital urge. Adler felt the necessity of establishing a more intimate connection between physical and mental manifestations but he did not make the mechanism of compensation clearer to his readers than Freud did the mechanism of conversion.

It will be only when we know what part of the organism produces an emotion and, reciprocally, what part of the organism is affected by a given emotion, that we shall visualize clearly the relations between mind and body. Then we shall understand the meaning of the vital urge and of the libido; then, the so-called nervous disturbances as well as consciousness and its content (thought) shall lose their mystery.

Edward J. Kempf, of Saint Elizabeth's Hospital, Washington, D. C., attacks the problem from a new and original point of view. Kempf states frankly his dislike of the term libido. Although that term attempts to represent graphically the energetic constitution of man and his love of life, it lacks clearness, for the human mind cannot very well conceive of a process as such, unless there is some thing that proceeds. The concept of electricity would be hazy, indeed, were it not that we can visualize dynamos, wires, sparks, bulbs and many other visible means of production or manifestation of the force called electricity.

In order to explain the great physiological changes which influence human thought and behavior and the biological nature of man, Kempf has developed a conception of the personality based on the reflex actions of the autonomic nervous system.

To him the human organism is a biological machine which assimilates, conserves, transforms and expends energy. All those operations are regulated by the autonomic apparatus which keeps in touch with the environment through the projicient sensorimotor nervous system. As the autonomic apparatus becomes conditioned (trained) to have acquisitive and avertive tendencies toward its environment, according to which cravings are active in a given situation, the organism's behavior is the resultant of a compromise between the opposed cravings. The importance of the brain is greatly minimized by this conception. Experiments have proved that the same form of behavior is not always due to the activity of the same brain cells and the theories which localize in certain regions

of the brain the controlling forces of all human conduct must be abandoned.

According to Kempf, brain and personality, so long associated in popular parlance, must no longer be considered as interchangeable terms. In fact, every part of the body contributes something to the personality and to its consciousness of itself. Should some one lose a limb or a group of muscles, he would lose at the same time an important part of his personality. This would manifest itself in the manner in which he would adjust himself to the stresses of daily life, what he would try to do and feel compelled to avoid. Analysis alone would reveal that fact; the natural readjustment of the remaining muscles would prevent any gross change from being observable. For instance, the loss of the eyes and arms would greatly reduce the ability to understand new machinery, new situations and probably reduce to an enormous extent the power of recalling experiences in which the eyes and hands played a predominant part, such as writing.

Because most of our thoughts are dependent upon our muscle sense, it may be said that we actually think with our muscles. If we allow ourselves to become aware of the visual image of an automobile, we are aware that it is moving, because the muscles of the eyeball shift the image by modifying their postural tensions. Sometimes the muscles of the neck may contribute more information by moving the head. If we are pushing the automobile ourselves, the muscles of the body come into play to furnish other images, and if we are pushing it along a cold, wet, muddy road, the sensations of cold, wetness and mud arise from the tactile receptors of our legs.

Such a perfect correlation between our autonomic apparatus and the sensorimotor system is a gradual acquisition of the human being in the course of its development. At birth, we have a welldeveloped, wellbalanced autonomic apparatus and a poorly coordinated sensorimotor system. The autonomic apparatus, however, begins immediately to coordinate and control the sensorimotor system in order to master its environment.

A most important factor begins to exert pressure upon the infant from the moment of its birth and exerts it throughout life. It is the incessant pressure of the social herd, which modifies the autonomic apparatus and compels it to adopt less and less primitive, more and more civilized and indirect methods of satisfying the various human cravings. The tone or tension produced by the autonomic apparatus in the muscles which move our body and limbs determines largely the content of our consciousness or thoughts. This leads us to a complete reversal of the view held by the academic philosophers and psychological laboratory observers.

According to them the emotions are one of the results of the mind's contemplation of phenomena taking place within or without the organism. Bodily reactions and mental reactions take place after the emotion has been experienced. James and Lange advanced the theory that our feeling of bodily changes, following the perception of a stimulus, is the emotion. Kempf goes further and states that if we experience an emotion, it is because some

parts of the autonomic apparatus have assumed a certain tension which produces the motion. As evidence, he cites the fact that we are at times disturbed at night by fearful tensions whose cause is unknown and then awaken to find that there is some one in our room. Nursing mothers experience vigorous disturbances in their sleep long before they become aware that their child is in distress. We become conscious of images of urinating in our dreams and find, upon awakening, that uncomfortable tensions of the bladder have been active for some time owing to the accumulation of urine.

Kempf's theory of the dynamic mechanism is worded as follows: "Whenever any segment of the autonomic-affective apparatus is forced into a state of hypertension through the necessities of metabolism or endogenous or exogenous stimuli, the hypertense segment gives off a stream of emotion or effective craving which compels the propitious apparatus to so adjust the exteroceptors in the environment as to acquire stimuli which have the capacity to produce comfortable postural readjustments in those autonomic segments."

In other words, whenever autonomic nerves, for instance the nerves causing the contractions of the stomach known as hunger are made extremely tense by the sight or smell of food, they produce a strong emotion or desire which compels the sensorimotor nerves to apply the mouth to food, after which the tension of the autonomic nerves is relieved.

Kempf maintains that this biological principle or law is the foundation of all human and animal behavior, to be seen throughout all its workings, whether brief and trivial or prolonged and elaborate. "The seeking and creating follows the corollary 'to obtain a maximum of autonomic gratification with a minimum expenditure of energy,' thus developing increasing skill and power, extension of influence and assurance of comfort and an increasing margin of safety from liability to failure."

Most of the nervous tensions originating in the autonomic apparatus have as their biological aim the acquisition of appropriate pleasant stimulations and the avoidance of destructive unpleasant ones; for instance, they direct us toward food and away from some danger. They are relieved only when their objective stimulus is attained. In certain cases the object is unattainable, being socially tabooed or having passed beyond our reach, as for example when a loved person dies. In such cases, tensions will remain unrelieved and become seriously distressing as well as dangerous for our mental and physical health. Among other things, they disturb the blood supply to certain organs and hence weaken them in their struggle against the bacteria of infectious diseases. In case of tuberculosis, pneumonia, typhoid, excessive fatigue, an exaggerated emotional tension may be fatal. In other words, the individual who represses certain cravings because they are ungratifiable or for fear of the influence their gratification may have on his social standing, tends to have organs which are more susceptible to disease.

The struggle between conflicting cravings was considered by psychologists of the old school as

taking place in our mind. Kempf shows us that it takes place in our autonomic apparatus. The sacral division may be conditioned to need stimuli that are perverse or tabooed and cause irritability and depression until gratified, whereas their unrestrained indulgence may greatly jeopardize the love for social esteem and the feeling of social fitness. The secret sense of social inferiority, due to some one's awareness of tabooed pelvic cravings, makes life in human society a fearful ordeal, which in turn disturbs the respiratory, circulatory and gastronomic functions. Hence the needs or cravings of the different autonomic segments converge upon the projecting apparatus and behavior is the physical or mechanical resultant. This compels the different autonomic segments to wage fierce conflict for control of our conduct and our conduct reveals the conflict.

That struggle grows fiercer as the civilization in which we live grows more complex. At birth, the autonomic apparatus works smoothly, because the infant is dependent upon the mother and hence irresponsible. But when the mother begins to train the infant to nurse, urinate and defecate under certain specific conditions, the autonomic apparatus for the first time clashes with society which insists on selfrestraint, selfcontrol and selfrefinement.

Heedless indulgence by an individual of any age causes uncomfortable tensions in his associates (disgust, fear, anger), and therefore they are compelled to control social tendencies in every individual from his earliest childhood. Acquisitive cravings know no social law, however, and often threaten to jeopardize the personality by impelling it to do something which is illegal or immoral. For, after all, man is simply an ape that has learned to wear clothes, to use words and signs and that can foresee in a general sense the possible biological and social results of certain indulgences.

Autonomic segments of the infant are then trained (conditioned) to react to certain stimuli, for instance, to certain vocal sounds and touches indicating the time for nursing, to signs and touches indicating disapproval of certain acts; the fear of losing certain agreeable stimuli gradually develops in him a certain degree of selfcontrol. Many cravings of an ungratifiable or unjustifiable nature, however, resist all attempts on the part of our environment to curb them. Compensatory strivings are then set in motion to prevent them, either from manifesting themselves or from being recognized in order that the organism may escape the concomitant fear. A state of fear induces malnutrition and impotence and hence would be destructive for the individual and the race.

When a craving is allowed to make the organism aware of its needs, but is not allowed to cause overt acts, it is said to be suppressed. When it is not allowed to cause the organism to become aware of its needs, it may be said to have been repressed. But neither suppression nor repression is synonymous with annihilation. Whether we remain in ignorance of the fact that a boiler is full of steam or simply disregard that fact, the steam is there, seeking an outlet and likely to create an abnormal one, unless a normal outlet is provided.

Repressed autonomic segments, like steam in a boiler, need but the slightest opportunity offered by the environment, or the slightest relaxation of the repressing forces to obtain control of the sensorimotor nervous system. We may suppress our disgust or anger to save appearances, but we will at the same time, by remarks, by our very tone of voice or gestures, betray our real feelings; we will have dreams which picture the attempted or successful gratification of suppressed cravings. The essential difference between most sane and insane people is that insane people cannot control their repressed cravings while sane people can. That is to say, when people become fatigued, toxic, dazed, and can no longer control their repressed cravings, those cravings cause a form of behavior which is termed insane.

As the human individual grows and develops, he gradually becomes able to control the activities of the various cravings with the exception, however, of the sexual cravings. When sexual cravings are normal, they are naturally justified, and, under certain conditions, they are permitted socially to dominate our behavior.

When the personality, on the other hand, considers sexual cravings as shameful inferiorities, either because they are perverse or because the personality has been educated in a prudish way, the individual becomes forced into a form of adjustment which is abnormal on the account of the autonomic conflict it entails. Whenever a violent conflict rages in our autonomic apparatus between acquisitive and avertive cravings, a neurosis ensues, or rather, the neurosis is the conflict. No constitutional predisposition is needed to bring about its onset. Life's experiences and the influence of our environment and associates are sufficient as determining factors.

Kempf does not accept Freud's theory as to the importance of sex (love) in the causation of neurotic disturbances. Any of the primary cravings, love, hate, hunger, shame, sorrow, fear, or disgust, may cause a neurosis under appropriate conditions. The neurotic is suffering from cravings which he cannot allow to dominate his personality. Those cravings are so often located in postural tensions of certain organs that they are probably consistent things, even if they are not always discoverable. A strong craving, like the famishing influence of protracted hunger, which originates in the stomach, or the severe itching of an area of the skin, may finally determine all the adjustments of the entire personality and be felt over the entire body. The result may be a severe struggle to eliminate the craving from the personality. Or the personality may resign itself to the domination of the craving and to a regression in which the individual enjoys tensions and images, fancies, delusions, hallucinations which simulate the craved reality.

On the basis of this conception of the personality, Kempf rejects entirely the usual classification of mental disturbances into neuroses, psychoneuroses and psychoses. That classification is very unscientific and unbiological for it is based upon symptoms which may change under different conditions or under the care of different physicians. In many

institutions, for example, the diagnosis manic depressive tacitly means recoverable, while dementia præcox means incurable, so that if a dementia præcox patient shows a tendency to recovery he is reclassified as manic depressive. Kempf's classification takes into account the nature of the patient's autonomic cravings and his attitude toward them. It is, therefore, essentially mechanistic and truly biological. Every nervous disturbance is designated as a neurosis.

The neurosis, then, is termed acute, chronic, or periodic, according to its duration. The term acute is reserved for cases of less than a year's duration. Chronic is applied to cases having had more than a year's duration, or which have had an insidious course for more than a year before the consultation.

Periodic is applied to cases which have periodic or intermittent episodes or recurrences accompanying natural phenomena, such as menstruation, pregnancy, marriage, death of a child, or other occurrences.

The neurosis is further qualified with regard to its mechanism, that is, the insight the patient has retained. The neurosis is benign when the patient recognizes that his distress or disease is due to the suppression of unjustifiable or ungratifiable cravings which are a part of his personality. The neurosis is pernicious when the patient refuses to attribute his trouble to a personal cause or wish, insists that it is due to an impersonal cause or a malicious influence and tends to hate anyone who would attribute it to a personal source.

According to the mechanism of the autonomic conflict involved, neuroses are differentiated into five types:

The suppression neuroses are characterized by the fact that the patient is more or less conscious of the nature and effect upon himself of his ungratifiable cravings. For instance, a man may be affected by his love for a faithless, indifferent or dead woman; a soldier may be caught between two fears, that of death and that of a court martial, and know that it causes him insomnia, headache, cardiac anxiety, diarrhea, or other disturbance.

In repression neuroses, the individual tries to prevent the autonomic cravings from making themselves known and influencing his personality. A repressed fear may make a man blind or lame and he may feel convinced that an actual fall, bruise or wrench is responsible for his condition, because he has succeeded in making himself forget the cravings that are relieved by being blind or lame.

Compensation neuroses are characterized by a reflex effort to develop functions which will compensate for some organic or functional inferiority or keep an undesirable craving repressed, which is unconsciously causing fear. Often the effort is adapted or designed to destroy or defeat environmental factors which arouse the intolerable craving or oppose the compensation. Egotism, intolerance, and exaggerated claims are typical of compensation neuroses.

Regression neuroses are just the opposite. The individual makes no effort to win or retain social esteem and regresses to a lower, childlike or infantile

level, becoming apathetic, slovenly, irresponsible, often showing suicidal tendencies, and allowing the cravings to do as they please. The regression may be a relatively benign episode of a few months' duration. It may in other cases be followed by a feeling of having died and passed through a rebirth, and also of having eliminated all the sinful cravings in order to begin life anew. This form of adjustment may work as long as the subject lives in a protected, noncompetitive environment. Later, an eccentric overcompensation often takes place which eventually leads to another neurosis or a permanent deterioration of the personality.

In dissociation neuroses, the patient succeeds in keeping his undesirable cravings repressed until they finally become dissociated. The individual is then conscious of weird distorted images, hallucinations of past sensations, and experiences which seem to gratify the dissociated effect although they horrify the individual. The individual is also dominated by unacceptable, mysterious obsessions, fears, compulsions and inspirations. There may be also severe visceral distress, motor disturbances, amnesia, or other manifestations.

The analytical treatment, as mapped out by Kempf, consists in establishing a transference, that is, giving the subject an opportunity to rely upon the altruistic judgment of some authoritative practitioner and enabling him to allow his repressions to make themselves conscious. Kempf disagrees with Jung on the extent to which the transference should be used and he considers it essential in order to help the neurotic to become socially constructive. Only in that way can the analyst fulfill the mission in which the neurotic's parents failed.

After the subject succeeds in giving full expression to his repressed affects, those affects become assimilated with the personality and form an intimate part of it, instead of remaining uncontrollable, unconscious or mysterious factors. In that way the dissociated cravings which cause obsessions, phobias, mannerisms, compulsions, delusions, hallucinations, regressions, eccentric compensations, and prejudices, are once more merged with the organism from which they had been abnormally separated and the functional distortion disappears. The subject having acquired insight and being free from the fear of something within himself, becomes capable of making a sensible, practical adjustment.

When that readjustment is effected an intelligent use of the reconstructive, suggestive method seems to be most effective in giving the neurotic new interests for which to live and work, without seeking abnormal compensations for prudish or fearful repressions or yielding to perverse cravings.

The choice of a method, Kempf thinks, should be left to the patient, but he should not be allowed to avoid the work of reconstruction. Furthermore, the analysis should be accompanied by vigorous indulgence in social play requiring exposure of functional or organic inferiorities to more or less critical evaluation by competitors. Thus the subject will become immune to the fear of failure or inferiority and will avoid eccentric compensation and a seclusive mode of life.

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TRICUSPID STENOSIS AND TRICUSPID
INSUFFICIENCY.*By JOHN J. YOUNG, M. D.,
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A review of the standard works on diseases of the heart shows that the physical signs of lesions of the tricuspid valve are exceedingly indefinite. Characteristic, if not pathognomonic, auscultatory, palpatory and percussion phenomena are known of most lesions of the heart and great vessels, but the conventional description of the physical signs referable to disease of the tricuspid valve is of little value in distinguishing this lesion from that of mitral stenosis, which, moreover, is an almost constant association. For example, it is stated that in tricuspid stenosis cyanosis is marked, but in our experience cyanosis in these circumstances is no greater in degree, perhaps less so, than that usually encountered in mitral stenosis. Clubbing of the fingers is a non-committal sign and is in no wise characteristic of tricuspid disease. The existence of a presystolic thrill over the tricuspid area, if it occurs at all, is extremely rare. A tapping systolic impulse over the lower sternal region and the adjoining intercostal spaces is of highly doubtful value, since a coexisting mitral tap cannot be excluded.

By percussion it is difficult, if not impossible, to distinguish whether enlargement of the right side of the heart is due to right auricular dilatation or right ventricular hypertrophy. The presence of a sharp valvular sound over the tricuspid region is not necessarily indicative of stenosis of the corresponding orifice, in view of the fact that the sharp contraction of the hypertrophied right ventricle may be invoked to explain the alteration of the first sound in mitral stenosis.

The lack of specificity in the symptomatology of tricuspid disease, as usually described, prompts us to record the anatomical and clinical findings in a series of four cases of tricuspid disease, and to call attention to certain pulsatory phenomena in the liver, which, we think, are characteristic of certain lesions of the right side of the heart.

True intrahepatic pulsation may be venous or arterial in origin. In rare cases of aortic insufficiency expansile enlargement of the liver is clinically appreciable and is arterial in nature. Venous pulsation of the liver is produced by the reflux of blood from the right side of the heart through the inferior vena cava, thence to the hepatic vein and through the liver lobule. It is known that regurgitation through the great veins from the auricles of the heart is favored by dilatation of these chambers and that the venous orifices of communication with the atria participate in the process. In normal circumstances, the circular layer of smooth muscle in the walls of the cavæ at their entrance to the heart acts as a valve and

by its contraction effectually prevents excessive backward flow of blood during auricular systole. Regurgitation is furthermore favored by anatomical alterations in the musculature of the right side of the heart so that dilatation is brought about, producing relative insufficiency of the tricuspid orifice, the valve segments themselves being unchanged but nevertheless inadequate to guard an orifice rendered abnormally large by muscular relaxation.

The presence of the normal jugular pulse with its positive and negative components may be determined, of course, by graphic methods and, indeed, in many individuals several of the waves can be identified by inspection. True intrahepatic pulsation, on the other hand, is never encountered in normal individuals.

Clinically, pulsation of the liver may be transitory or permanent. The former is often observed in association with myocardial insufficiency attended by marked dilatation of the right side of the heart. Physical examination corroborated by graphic methods, shows that this type of pulsation in the jugular vein and in the liver is synchronous with ventricular systole, and that during systole a certain quantity of blood is regurgitated through the incompetent tricuspid orifice into the auricles and thence into the cavæ. Under the influence of rest, with or without digitalis or its allies, the liver ceases to pulsate and venous engorgement and pulsation in the neck become less marked, an effect due, presumably, to decrease in the size of the heart with resumption of the function of the tricuspid valve.

Thus, a patient who, on early examination, presents hepatic pulsation with or without signs of venous engorgement and pulsation in the neck should be investigated from the point of view of possible organic disease of the tricuspid valve, if these signs do not abate under appropriate treatment, and if in other respects improvement occurs, as manifested, for example, by decrease in the amount of edema, lessening of ascites, hydrothorax and other physical signs.

The almost constant association of mitral and tricuspid stenosis and the not infrequent lack of localization of the mitral direct murmur, often render it impossible to accomplish satisfactory examination of the tricuspid area as delimited on the precordium; that is to say, the xiphoid region and the adjoining portions of the sternum and the ribs. Consequently, no satisfactory inference can be drawn from the presence of a rumbling diastolic or presystolic murmur over the tricuspid area that does not differ in quality from the murmur commonly heard over the apex in mitral stenosis, because the possibility of transmission cannot be ignored. If, on the other hand, there is present over the lower sternum a rumbling diastolic or presystolic murmur differing in quality and, perhaps, in intensity and duration from a murmur of similar time heard in the apical region, this finding may serve to aid in the diagnosis of tricuspid stenosis. Nevertheless, corroborative signs are to be sought. For example, if the auricles are acting properly, an excessively large wave in the jugular pulse and in the liver phlebogram is suggestive of tricuspid stenosis. In some cases double liver pulsation is appreciable and is explainable on the basis of a hypertrophied right auricle together with hin-

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drance to the entrance of blood into the right ventricle. Combined examination of the apex beat and the jugular pulse may indicate that the exaggerated wave is synchronous with auricular systole, even without the aid of instruments of precision. Tricuspid regurgitation is always a companion lesion of tricuspid stenosis.

When the auricles are fibrillating, the diagnosis is more difficult. In such cases the existence of organic insufficiency of the tricuspid valve must first be ascertained on the strength of continued pulsation of the liver and improvement in other respects, as previously noted. In many instances increased pulsation in the jugular veins may likewise be present. In some cases it is extremely marked, the bulb easily attaining the size of a large adult thumb. In other cases, however, jugular pulsation is a negligible factor. In our experience, on the other hand, hepatic pulsation was present as a constant phenomenon both in those cases in which the condition was correctly diagnosed during life and those in which its clinical recognition was overlooked. Pulsation is, of course, synchronous with ventricular systole. In our experience, too, enlargement of the liver is constantly present and depends on chronic passive congestion. If, in addition, a distinct rumbling diastolic murmur is heard over the tricuspid area, the diagnosis becomes still more probable.

Even though such a murmur cannot be distinguished from an apical murmur similar in time, if tricuspid insufficiency is present, it is reasonable to assume the existence of some degree of stenosis in view of the frequent association of mitral stenosis with mitral insufficiency. In adults with organic mitral disease it is unusual to find pure mitral insufficiency. In such individuals a diastolic rumble can usually be heard in the region of the apex of the heart after having the patient exercise or by placing him in the left lateral recumbent posture, or even without resorting to these expedients. As a rule, stenosis of the tricuspid valve is seldom of the tight variety, although those pathological conditions of the valve segments which make for insufficiency also determine the occurrence of stenosis.

CASE I.—The patient, a male, aged twenty-seven years, was admitted to Bellevue Hospital complaining of dyspnea and edema of the legs. Examination revealed, in brief, the apex beat of the heart in the fifth left interspace at the nipple line. The right border of the heart was made out by percussion midway between the right mammillary line and the sternal line. An inconstant presystolic thrill was palpable at the apex and there was felt a distinct epigastric systolic shock. On auscultation, a rumbling presystolic murmur was heard at the apex, and as the sternum was approached another murmur, systolic in time, was heard, increasing in intensity to the right of the lower part of the sternum, being heard almost to the right nipple line. This murmur was quite harsh. Over the lower part of the sternum a soft diastolic murmur was heard, which at first varied with respiration, disappearing with a full inspiration. On the day before the patient's death it was quite constant. There was no accentuation of either second sound at the base. No pulsation was noted in the veins of the neck. The liver

was large and pulsated distinctly. The radial pulses were small and equal on the two sides. There were signs of congestion at the bases of the lungs. The clinical diagnosis was: Chronic cardiac valvular disease; mitral stenosis and regurgitation; tricuspid stenosis and regurgitation. The diagnosis of old tricuspid valvulitis was made in this case because of the marked extension of cardiac dullness to the right of the sternum, the peculiar murmurs heard at the tricuspid area, entirely different from those heard at the apex and the forcibly pulsating liver. The patient died suddenly.

Autopsy revealed the lungs more or less adherent. There was a hemorrhagic area in one lower lobe. The heart was enormously enlarged and the pericardium adherent throughout. There was marked hypertrophy and dilatation of the right auricle and ventricle and their cavities were filled with blood. The left auricle and ventricle were likewise hypertrophied and dilated. The pulmonic segments were normal. The tricuspid leaflets were adherent and thickened, leaving a ring that admitted two fingers. The mitral orifice was quite contracted, admitting a lead pencil; chordæ tendineæ thickened and retracted; aortic valves thickened and edematous, but not indurated; liver enlarged and congested; spleen and kidneys firm and congested.

CASE II.—The patient, a male, single, aged twenty-eight years, a native of Poland, entered the medical service of Bellevue Hospital with a complaint of shortness of breath of four years' duration. His family history was negative. Except for two attacks of gonorrhœa in youth, a chancre five years ago, and an attack of pains in the legs, not localized to the joints, in childhood, his past history was negative.

Four years previous to admission to the hospital, the patient noticed dyspnea, palpitation and rapid heart action on exertion, and became easily fatigued. For the same length of time he suffered from pain in the right upper quadrant that was not related to the ingestion of food. Two years preceding his entrance into the hospital, he first noticed swelling of the legs that became more marked in the four months just before admission, necessitating confinement to bed at intervals. The patient stated that he was distressed by attacks of vertigo, without syncope or convulsions, and by sharp non-radiating precordial pain.

Physical examination showed a well nourished, well developed adult male patient, acutely ill. There was no orthopnea, and cyanosis was moderate.

Examination of the heart on the day of admission, September 21, 1917, revealed systolic heaving of the entire precordium. The apex beat was felt as a diffuse impulse in the sixth left intercostal space, well outside the nipple line. The percussion outlines of the heart borders were five cm. to the right in the fourth space, and 16 cm. to the left in the sixth space. There was increased dullness over the second left interspace. Over the apex was heard a blowing systolic murmur transmitted to the axilla, and a rumbling diastolic murmur with presystolic intensification. At the ensiform cartilage another blowing systolic murmur was heard. A blowing diastolic murmur was heard along the left margin

of the sternum, with maximum intensity in the fourth left intercostal space; also a soft systolic murmur at the aortic area that was not transmitted. The pulmonic second sound was accentuated and reduplicated and accompanied by a diastolic shock felt in the second left interspace. The heart action was regular, the radial pulses equal, regular, small, and of low tension. On September 22nd, a whistling diastolic murmur was noted over the ensiform that was different in quality from any other murmur heard in the heart. On September 26th, a superficial to and fro scratching murmur was heard to the left of the sternum in the fourth and fifth spaces. The rub was intensified by pressure of the stethoscope. On October 21st, there was heard a systolic murmur over the lower part of the xiphoid, and at times a wavy diastolic murmur was audible in the same location, and was different from the murmur heard at the apex. The spleen was enlarged to percussion, but its edge was not felt. On admission, the liver edge was felt four and one-half fingers' breadth below the costal margin in the mammillary line. The organ was tender and showed distinct pulsation; its surface was smooth. An electrocardiographic tracing taken on September 26th showed auricular flutter and relative preponderance of the right side of the heart. Phlebograms showed a pronounced *a* wave in the jugular pulse and a large *v* wave in the liver pulse. Urinary and ophthalmoscopic examinations were negative.

At autopsy the precordial area was large, measuring seventeen cm. from apex to base, sixteen cm. in the transverse direction. The parietal pericardium was quite thin. The pericardial cavity contained about eight ounces of blood tinged fluid with fibrin flocculi. The visceral pericardium was granular in appearance. There were several small milk patches scattered over the epicardium of the right ventricle. The heart was huge, weighing 570 grams. The apex was blunt but was still formed by the left ventricle. The right auricle was dilated and the musculi pectinati hypertrophied. The tricuspid orifice was constricted, the valve margins being thickened, adherent and rounded. On the edges of the line of closure there were a few small recent verrucous vegetations. The right ventricle was hypertrophied, its wall measuring eight mm. The pulmonary valve was normal. The left ventricle was contracted, its wall measuring twelve mm. The left auricle showed considerable dilatation with slight thickening of its walls. There was marked stenosis of the mitral orifice, the ring being reduced to a narrow slit which did not admit the tip of the little finger. The valve segments were thickened, adherent and calcified. The chordæ tendinæ were short and thick. The aortic cusps were considerably fused, thickened and retracted; coronary arteries and aorta showed no noteworthy changes. The clinical diagnosis was: Chronic valvular disease; mitral stenosis and regurgitation; tricuspid stenosis and regurgitation; aortic regurgitation.

The anatomical diagnosis was: Chronic mitral valvulitis; chronic and acute verrucous tricuspid valvulitis; chronic aortic valvulitis.

CASE III.—A middle aged male patient entered Bellevue Hospital in March, 1920, complaining of

dyspnea and sharp pain in the left side of the chest. His past history was negative except for gonorrhoea followed by multiple arthritis in early life. The patient had no recollection of rheumatic fever. He stated that in early childhood he suffered from dyspnea on exertion, which became progressively worse, and recently had necessitated complete rest in bed.

Examination showed a poorly nourished male, quite dyspneic and cyanotic, propped up in bed. His bodily configuration and the hair distribution conformed to that of status lymphaticus. There was marked arterial pulsation in the neck. There were signs of a small amount of fluid in both pleural cavities. The apex beat of the heart was felt in the sixth left intercostal space in the anterior axillary line. There was dullness to the right in the third space, extending almost to the nipple line. In the region of the apex there was forcible systolic retraction of the ribs and the soft parts; there was a similar phenomenon posteriorly in the tenth and eleventh interspaces on the left. The lung did not move over the precordium on inspiration. It was impossible, in view of the size of the heart, to determine whether its outlines changed with alteration of the patient's position. The sternum rose with inspiration. The pulmonary conus percussed enlarged. At the aortic cartilage there was heard a harsh systolic murmur transmitted to the vessels of the neck. Along the left margin of the sternum a blowing diastolic murmur was audible. At the apex there were heard a blowing systolic murmur and a rumbling diastolic murmur. Over the tip of the xiphoid there was a systolic murmur of higher pitch than that heard at the apex and more musical than the aortic murmur. The diastolic rumble in this area was not as rough as that heard at the apex. The pulmonic second sound was accentuated; the aortic second sound was not heard. The rate of the heart was slow, and its action was absolutely irregular. The radial pulses were small. The liver edge was felt three fingers' breadth below the costal margin, firm and sharp, and the liver pulsated vigorously. There was moderate edema of the lower extremities with slight decubital edema. During the entire stay of the patient in the ward, even though he improved markedly for a time, the liver continued to pulsate.

The clinical diagnosis was: Chronic cardiac valvular disease; aortic stenosis and regurgitation; mitral stenosis and regurgitation; tricuspid stenosis and regurgitation; adherent pericardium (indurative mediastinopericarditis).

At autopsy, the heart was large, the pericardium being everywhere densely adherent, so that it had to be dissected away from the heart muscle. The right auricle was tremendously dilated, the tricuspid valves were thickened and their edges fused. The right ventricle was dilated and somewhat hypertrophied. The pulmonic valves were normal. The left auricle was considerably dilated, the mitral valve presenting a buttonhole stenosis. The left ventricle was much hypertrophied and dilated. The aortic cusps were thickened, retracted and fused for a short distance. The spleen, liver and kidneys showed chronic passive congestion.

CASE IV.—The patient, a man, single, aged twenty-seven years, a native of the Philippine Islands, was admitted to Bellevue Hospital, January 24, 1920. The patient stated that he had had an attack of rheumatic fever two years previously. Three weeks before his entrance to Bellevue Hospital, he was admitted to the New York Hospital with the symptoms of acute heart failure. At that time the Wassermann reaction was strongly positive, and mixed treatment was given in conjunction with injections of salvarsan. At the time of admission to Bellevue Hospital the patient was dyspneic and had to be propped up in bed. Cyanosis was moderate. There was no tracheal tug, no tracheal displacement, no tracheal fixation. Venous pulsation was present in the neck but was not well marked. Examination of the heart showed that the apex beat was to be felt in the seventh left interspace, about seven inches from the midsternal line. It was forcible and localized. The dullness measured two inches to the left and an inch to the right in the second intercostal space, and one and one half inches to the right in the third space. At the apex were to be heard a blowing systolic and a rumbling diastolic murmur. At the base of the heart a long, soft, blowing diastolic murmur was heard with maximum intensity in the third left interspace, adjoining the sternum. A soft systolic murmur was also heard at the base. The pulmonic second sound was accentuated and the heart's action was rapid and irregular. Diagnosis, on admission was: Syphilitic aortitis; dilatation of arch of aorta; aortic insufficiency; cardiac hypertrophy and dilatation with relative mitral insufficiency, relative tricuspid insufficiency; apical murmur, probably Flint.

Two days after admission, a rough systolic murmur was heard over the pulmonic area, sharply circumscribed on the precordium, yet heard in the vessels of the neck. The aortic second sound was not audible over the aortic cartilage nor in the vessels of the neck. The second sound over the pulmonic area was sharply accentuated and accompanied by a diastolic shock. On January 31st, a loud rough systolic murmur was heard with maximum intensity in the third left interspace. It was transmitted upwards and was heard distinctly in the carotid vessels and there was also a marked systolic thrill to be felt in the third left intercostal space. The aortic second sound was faint, if heard at all. On this day it was also noted that the radial pulses were strikingly small for an uncomplicated aortic insufficiency, and the diagnosis was altered to that of aortic stenosis and insufficiency of specific origin, with relative mitral and tricuspid leakage with Flint murmur. On February 3rd, a loud systolic murmur was heard over the tricuspid area that was different from other murmurs noted hitherto, and on the 8th, a questionable diastolic rumble of different quality was also noted at the same situation. There was, however, but little venous pulsation in the neck. The clinical diagnosis was again altered to that of aortic stenosis and insufficiency; mitral stenosis and insufficiency, all lesions of the rheumatic type. An explanatory digression may not be amiss. Organic mitral disease was diagnosed because of the patient's previous

history of rheumatic fever, the enlargement of the pulmonary conus as indicated by extension of percussion dullness to the left in the second interspace, the accentuated pulmonic second sound coupled with a diastolic shock, and, perhaps, the small pulse—features indicative of right heart hypertrophy and characteristic of mitral stenosis. As it is a safe clinical working rule never to invoke two pathological causes to explain a given abnormality if such can be accounted for on a single etiological basis, the diagnosis of syphilitic aortic disease was abandoned for that of old rheumatic endocarditis. The curious tricuspid findings also pointed against the diagnosis of specific aortic valvulitis.

The radial pulses were uniformly small but irregular in force and frequency and Corrigan in type; all palpable pulses were small. The scrotum was markedly edematous and there was marked edema of the lower extremities. The abdomen was distended; there was slight shifting dullness. The liver, on admission, extended two fingers' breadth below the costal margin, was tender, and pulsated. On January 31st, the liver was still pulsating; likewise on February 2nd. On February 8th, the liver was pulsating strongly, in spite of the fact that there was a decrease in the amount of the edema. On February 9th, there was no change. Two murmurs were heard over the tricuspid area, probably different in quality from the others. In view of these findings, coupled with the fact that the hepatic pulsation had become more marked with slowing of the heart, the diagnosis was changed to mitral stenosis and regurgitation; tricuspid stenosis and regurgitation; aortic stenosis and regurgitation. The patient died on February 27th.

Autopsy showed tremendous enlargement of the heart, especially the right side, the inferior vena cava at its junction with the auricle being about twice the normal diameter of the vessel. A small seropurulent encapsulated pericardial effusion lay posteriorly. The diaphragmatic pericardial surfaces were adherent. The aorta lay to the left of the median line, having been displaced by the dilated right heart. The right ventricle was markedly dilated and hypertrophied. The tricuspid valve was thickened; its segments were adherent so that the valves resembled a continuous sheet of tissue. The chordæ tendineæ were shortened and thickened. The orifice admitted about two fingers. The right auricle was huge. The mitral valve was thickened, the segments fused, the chordæ short and thick, and there were many soft, fresh, warty nodules on the line of closure of the valve. The orifice admitted the tips of two fingers. The left auricle was dilated, its walls being somewhat thickened. There was hypertrophy and dilatation of the left ventricle. The aortic cusps were thickened and partly fused. There were many fresh verrucous vegetations along the line of closure of the valve. The pulmonary valve was normal, as was also the aorta in its entire extent. There was no anatomical evidence of lues.

The most valuable clinical sign of organic tricuspid disease is the presence of a pulsating liver which continues to pulsate or even pulsates more markedly under influences calculated to effect disappearance of this phenomenon.

CLINICAL NOTES FROM THE FIRST SUR-
GICAL DIVISION OF FORDHAM
HOSPITAL.

(*Second Series.*)

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The work which forms the basis for this report embodies the efforts of many men associated with the first surgical division of the hospital. Without going too deeply into matters of organization we should like to say that every effort is made to bring our patients into contact with the group idea. By close association of visiting surgeons, associate surgeons, the house staff and the outpatient staffs we attempt to afford the patient the best available skill in diagnosis and treatment while within the hospital walls, together with a properly supervised subsequent treatment after the patient has sufficiently recovered to leave the wards. To this end consultation between the attending surgeon and his associates is frequent, and interchange of opinion is sought, that the best interests of the patient may be served. Co-operation between the strictly professional staff and the social service department is well maintained.

Our first case in this series deals with a condition which is not so frequently met with today as in the past—at least not in the degree observed in our patient. We present this case because of the difficulties of diagnosis arising from the magnitude of the pathological condition—a rather unusual reason for difficulty in diagnosis:

CASE I.—The patient, a girl of twenty, was sent to the hospital with a provisional diagnosis of ascites. For this reason she was admitted to the medical wards and after a short period of observation surgical consultation was asked for. She gave the following history: Occupation, stenographer. Family history: Father and mother both living and well; five brothers and two sisters living and well. Previous history: Up to a year ago the patient had been perfectly well. Present illness: A year ago the patient noticed that her abdomen was increasing in size. She suffered no pain nor discomfort, being able to go about her daily work. Because of the enlargement she consulted a physician who told her that she had fluid in her abdomen and advised her to go to a hospital for treatment. She did not at once accept his advice. Six months ago she found that her menstruation was becoming irregular; previously she had menstruated in a normal manner, beginning when she was twelve years of age, the periods recurring regularly every twenty-eight days, lasting three days, a little scant if anything, and associated with slight premenstrual pain. Six months ago she began to menstruate in a fourteen day cycle, the character of the epoch remaining unchanged. Her chief complaint, therefore, was enlargement of the abdomen with marked menstrual disturbance.

Examination: In general the patient appeared to

be a fairly normal young woman, slight in build, somewhat delicate in appearance, rather markedly anemic, but fairly well nourished. Examination of the heart and lungs showed normal organs. Examination of the liver, kidneys, and spleen was unsatisfactory because of the enlargement of the abdomen. The urine was normal. Leucocyte count showed a total of 8,400 cells, with a percentage count as follows: polymorphonuclear cells sixty-six per cent., lymphocytes twenty-eight per cent., large mononuclear cells six per cent. The contour of the abdomen was smooth and generally rounded, with a slight sagging in the flanks—equally noticeable on right and left sides. The skin was glossy, apparently under some tension, and the superficial veins were dilated in an irregular manner. The percussion note was flat over all the abdomen, and with a change of position of the patient from side to side no tympany could be demonstrated. The position of the intestines could not be made out by percussion. A fluid wave was easily demonstrated. There were no masses, and no points of tenderness. By rectal examination a small markedly retroverted uterus was felt in the posterior cul-de-sac. Diagnostic consultation participated in by members of the staff gave us a choice of three probable diagnoses: a, ascites associated with some form of portal obstruction due to an hepatic sclerosis; b, tuberculous peritonitis; c, a very large ovarian cyst.

Operation: Under ether anesthesia a median hypogastric incision revealed an enormous unilocular ovarian cyst springing from the left side. The left tube, greatly enlarged and thickened, curved over the summit of the cyst, which lay partly between the folds of the extremity of the broad ligament. The cyst contained perfectly clear limpid fluid. There was no distention of the cyst with fluid. It had the appearance of a cyst which had been partially emptied, and this semifilled condition allowed it to accommodate itself to the irregularities of contour of the walls of the abdominal cavity. It was removed together with the incorporated tube. The patient made an uneventful recovery.

It is rare that the large things which we encounter make diagnosis difficult, but in this case it was the hugeness of the cyst, allowing it to fill the abdominal cavity, that caused a doubt to enter our minds as to the correctness of the diagnosis. Afterthought, which is so helpful, permits us to make the diagnosis without difficulty by relying upon the outstanding features of the history and examination: Enlargement of the abdomen without symptoms other than those of ovarian dysfunction, the presence of fluid, and the markedly retroverted uterus.

The next case serves to emphasize the value of close association among members of the staff. In no other type of case is the need for consultation greater than in the head cases of a surgical division. Here the neurologist, the ophthalmologist, the otologist, and in suitable cases the orthopedist, bring help of a very vital nature and it is only by the liberal aid of our associates in these lines that the best results can be obtained by the attending surgeon. It is also in this type of case that the wideawake house surgeon proves his quality by anticipating the need and

arranging for the necessary collaboration. We believe that real team work made possible the favorable outcome in the following case:

CASE II.—Mrs. M. McK., aged fifty-six, was injured in the collision of two automobiles. The car in which she was riding was thrown against a pillar, but it is not known that she struck the pillar. The early notes by the ambulance surgeon show that the patient was found unconscious shortly after the accident, and could not be aroused. Her left clavicle was broken at the midpoint, and there was a severe abrasion over the sacrum. There were no other marks of external injury. There was a slight amount of hemorrhage from the mouth, but none from the ears or nose. There was no local injury about the eyes. There was no laceration of the scalp. No paralysis was evident, and the patient had had no convulsions. Immediate examination of the eyes showed no nystagmus, and no strabismus; the pupils were equal, small, and reacted to light. The pulse was eighty-four with one beat skipped in ten, and the breathing was thirty to the minute, and stertorous.

The patient was brought to the hospital and, after being placed in bed, vomited a large amount of brownish material, with considerable undigested food; there was no blood in the vomitus. She roused from her unconsciousness and was incoherent, and irrational, and inclined to be noisy. Her blood pressure was 160 systolic, 120 diastolic. Otologist's note (Dr. W. M. Dunning): "The ears are normal except for the presence, on the left side, of the evidence of an old inflammatory middle ear condition. There is no evidence here of cranial injury." Neurological examination: Eyes: no conjunctival or subconjunctival ecchymosis; no strabismus; no nystagmus; pupils were equal, smaller than normal, and reacted briskly to light. Reflexes: both knee jerks are lively, the left reflex greater than the right. There was no Babinski reaction and none of the associated and confirmatory signs. Triceps and supinator reflexes were normal. The superficial abdominal reflexes could not be elicited. There was no paralysis, and no anesthesia.

The first day following injury: The patient was kept in bed, and an ice bag was applied to the head. The fractured clavicle was dressed. Her condition changed little; bowels moved and she was able to void urine; there was no incontinence. Her mental condition approached stupor from which she could be aroused for nourishment, and in the periods of consciousness she was irrational but easily controlled. Her temperature was 100.5°, and her breathing changed from stertor to regular and quiet respiration. Her pulse remained about 80 and still showed the tendency to skip. Blood pressure was 140 systolic, 105 diastolic.

The second day following injury: The following ophthalmological observation was made (Dr. Charles Graef): "The pupils are equal and react to light; there is fulness of the veins and a blurring of the disc margins; there is evidence of a low grade neuritis in the left eye, less noticeable in the right eye. There is nothing to base the cerebral condition on at present; patient is rather dull but conscious." The temperature ranged between 99° and 100°, the

respiration was normal in rhythm and rate. The blood pressure was 160 systolic, 120 diastolic.

The third day following injury: The patient's condition was not markedly changed except for lessened irrationality, although any attempt at eliciting information from her caused her soon to relapse into incoherence. She complained of headache. The knee jerks were still very active. The blood pressure was 145 systolic, 110 diastolic. Temperature, pulse, and respiration were normal.

The fourth day following injury: The patient had a little respiratory irregularity which slightly,—but definitely,—upset the rhythm of her breathing. This condition was transitory and was not repeated; the observation was made by the nurse (Miss Kelly). Observation of the mastoid processes at this time did not show any evidence of ecchymosis. Mentally the patient was dull and in her periods of consciousness the same tendency to trail off into irrationality was observed. She still complained of headache. Except as noted, pulse, temperature, and respiration were normal. Blood pressure had fallen to 130 systolic, 90 diastolic.

The fifth day following injury: The signs of increased intracranial pressure were more marked on ophthalmoscopic examination. Dr. Graef confirmed the findings of the director in the following note: "Signs of low grade neuritis most marked in patient's left eye. Very tortuous veins and marked edema of the disc." Neurological examination confirmed the first findings without disclosing any new lesion. The knee jerks were still very lively, and the left more so than the right. The cranial nerves showed no lesion other than that indicated by Dr. Graef's note. The superficial abdominal reflexes were still absent. The blood pressure was 130 systolic, 85 diastolic. The patient still complained of headache but the mental condition showed improvement in that the irrationality was not so marked, although the dulness continued.

In the morning of this day the rhythm of the respiration was again disturbed, the attack this time not being transitory in character but tending distinctly to increase in gravity. The periods of apnea increased from four or five seconds in duration, to an alarming condition in which the respiration was decidedly of the Cheyne Stokes type, and the periods of apnea occasionally exceeded twenty seconds in duration. Before operation the minute count of respirations was frequently less than seven. The pulse began to share in the embarrassment of the medullary centres and decompression was resorted to.

Operation: Subtemporal craniotomy was done on the left side, the opening being by means of the Hudson drill and rongeur. The exposed dura was seen to be whitened, and the vessels not clearly indicated. The feeling transmitted to the finger as it touched the dura was that of boardlike resistance. There was no transmitted pulsation. A small prick was made with the point of a knife in the dura and clear fluid, in a jet six inches' high, spurted from the opening. A test tube was not at hand immediately and while one was being secured from the laboratory adjoining a finger was held over the opening and the fluid allowed to escape slowly.

When the test tube was ready the finger was removed and again the jet of fluid appeared and continued till the tube was filled, as from a fountain, when its escape was again controlled. Decompression was allowed to progress slowly, and it was impossible to estimate the amount of fluid that escaped from the dural opening. When the flow had ceased, the opening was enlarged and the brain was seen, as though at the bottom of a well; it was white, the convolutions were flattened, and only the feeblest pulsation was visible; it had the appearance of an organ which had been held in the hand and squeezed till it had become bloodless. In spite of the efficient decompression which had taken place the brain did not show any tendency to take advantage of the large amount of room that had been created for it by the escape of the fluid. It was quite apparent both from the appearance within the cranial cavity, and from the changed and vastly improved quality of the respiration and pulse, that decompression had been accomplished and was efficient. There was considerable annoying bleeding from the space between the dura and the bone, and this bleeding was checked as far as possible by pressure from within the cranial cavity before the closure of the dura. The dura was sutured with silk. Provision was made for the escape of fluid by means of a gauze wick led down to the wound in the bone and the soft tissue flap was replaced and sutured without any other drainage than this wick, which was led out at the upper angle of the skin wound. During the operation the pulse varied from 70 to 100, and the respiration became normal in rate and rhythm. Immediately after the opening of the dura the blood pressure was 105 systolic, 75 diastolic. The patient was returned to bed in good condition.

The subsequent history of the case is without special interest except for the smoothness of recovery. The temperature never was elevated above 100°, the pulse remained between 70 and 80, and the respirations continued regular in rhythm and normal in rate. Blood pressure varied between 105-75, and 120-75. The wound was dressed on the third day, the gauze wick removed, and primary union secured. The mental condition of the patient was most satisfactory and there was no recurrence of periods of irrationality; the only symptom referable to brain injury was a pronounced euphoria, which was remarked by her family, but which was apparent to us only as that delightful state of mind which we sum up in the phrase, "a very good patient." The clavicle healed in due course, and since discharged from the hospital the patient has remained in good health except for an occasional slight attack of vertigo.

The following cases are presented together because of the similarity of the symptom complex; both patients were admitted to the service at about the same time and the temptation to place them in the same diagnostic niche was strong:

CASE III.—Iris L., aged nine years, was brought to the hospital acutely ill. Past history: The patient had had measles, whooping cough, and bronchitis. Surgical history: Two years ago the little girl had been operated on for intussusception,

the appendix being removed at the operation, after reduction of the invagination.

Present illness: Patient had been well up to the morning of admission when she was awakened by a sharp pain in the right lower quadrant of the abdomen. The pain showed no signs of disappearing and she was given a dose of castor oil; she immediately vomited a large amount of undigested food. The vomiting recurred every five minutes until the patient was brought to the hospital some five hours later. Shortly after the vomiting began the patient had several movements of the bowels, at first diarrheal in character, then becoming decidedly mucous in quality, and finally being bloody. Examination at the time of admission: The patient was markedly in shock, temperature 99° and pulse 100. She complained of pain in her abdomen and examination showed that it was distended, rigid, tender, and contained an irregular ovoid mass in the region of the ascending colon. Operation was clearly indicated both by the findings on examination, and on the history; she was removed to the operating room.

CASE IV.—Mary P., aged three years, was admitted to the hospital and placed in the medical ward. The early history of the little patient was not obtainable, except that she was always considered a perfectly healthy child up to the day before admission.

Present illness: The day before admission the patient ate a large bag of plums—pits and all. Twenty-four hours later she began to vomit, had a little elevation of temperature, and a number of stools filled with mucus. She was brought to the hospital with a diagnosis of gastroenteritis. Examination at the time of admission did not reveal anything unusual except for the noticeable distention of the abdomen. The child was given castor oil and the symptoms abated, but did not completely clear up. The stools continued to have a decided mucus content. For the first four days the temperature ranged between 101° and normal, remaining normal after the fifth day, and until the eighth day. The urine was quite normal. Blood count made on the third day showed a total cell count of 6,800 with a percentage count of polymorphonuclear cells of sixty-five per cent., lymphocytes nineteen per cent., transitional type four per cent., and mononuclear cells twelve per cent. For the first week of its illness the child's diet was carefully supervised and in spite of some loss of weight its condition was considered satisfactory.

On the eighth day of the disease the patient was seized, suddenly, with acute abdominal pain, with distention, rigidity, and tenderness. All these symptoms were more marked on the left side of the abdomen. No movement of the bowels occurred, and no return was obtained from an enema. No mass was felt. The patient began to grow worse very rapidly. On the day following the patient was transferred to the surgical division, and examination revealed an emaciated child in marked shock, with a distended and tender abdomen, in which could be felt an irregular ovoid mass in the region of the descending colon. Blood and mucus had been passed during the night. The temperature was subnormal, the pulse was thready, and the little pa-

tient's face was pinched and white. During the time of her illness the little girl had lost so much weight—most of it in the twenty-four hours immediately after the onset of the acute pain—that the parents were scarcely able to recognize her. The blood count showed a total white cell count of 6,000 with percentage counts as follows: polymorphonuclear cells eighty-three, lymphocytes sixteen, transition type cells one. Operation was determined upon and the patient was removed to the operating room.

There is a decided similarity in the two histories just given: Both patients had sudden onset of pain, with blood and mucus in the stools, both had all the signs of shock, each had a distended, tender, rigid abdomen, and each had an irregular ovoid mass in the abdomen—in the one case over the ascending colon, in the other over the descending colon. Diagnosis was perfectly clear in the first case—the patient was suffering from a recurrence of her intussusception. Diagnosis in the second case was not so clear but the weight of evidence favored the diagnosis of intussusception; in fact it appeared that the signs and symptoms, together with a careful consideration of the history, pointed toward the diagnosis of a chronic intussusception suddenly grown acute. (We should like to say, parenthetically, that we have not yet seen a case in which the diagnosis of chronic intussusception was substantiated.) Brief extracts from the findings at operation are herewith appended, together with the pathologist's report in the second case:

CASE III.—Iris L.: The abdomen was opened in the median line and we immediately encountered and were able to reduce a well marked ileocecal intussusception, the summit of the intussusceptum having reached the middle of the transverse colon. After reduction the abdomen was closed in the usual manner, and there is nothing further to report other than a smooth convalescence. We feel that this case is unusual in that it is a recurrence of intussusception, the first operation having been done only two years previously.

CASE IV.—Mary P.: Laparotomy revealed a mass the size of a cantaloupe lying in the retroperitoneal tissue behind the descending colon, and separating the layers of the descending mesocolon. This tumefaction was found to merge into another irregular mass occupying the region of the pancreas, and spreading laterally into the kidney regions. There was no exudate of any kind within the abdominal cavity; the peritoneal covering of the colon, together with the separated leaves of the mesocolon, showed marked discoloration, and contained petechial hemorrhages. Incision was made into the swelling, through the external leaf of the descending mesocolon, and the larger portion of the mass was entered and found to consist of blood clot. The patient's condition forbade further investigation; a tube was placed in the cavity from which the blood clots had been evacuated and the abdomen was rapidly closed. The little patient did not rally. Pathologist's report (Dr. George Hohmann): "A large mass is palpable in the retroperitoneal space on the left side. At the base of this mass there is a peritoneal perforation one inch in

diameter (the site of the drain). Dissection of the mass reveals the following: It is posterior to the peritoneum; it is round, the size of a small orange, and situated in the region of the left adrenal which it entirely surrounds. The left renal vessels are involved in the new growth. The peritoneal covering gives it an encapsulated appearance. The tumor tissue is soft, mushy, and mottled in appearance, due to hemorrhagic infiltration. It has the gross appearance of hypernephroma; microscopical section of the tumor and enlarged retroperitoneal nodes reveal the growth as a very vascular myxosarcoma, originating in the retroperitoneal tissue."

The following cases of biliary system disease are interesting in view of the wide prevalence of such disease. Our tendency is to get away from the conception of biliary disease as a disease of middle life, and to attempt to bring these patients under treatment as soon after the initial attack of infection as possible. It is our belief that treatment means operation, and that early operation will be infinitely more successful and much less dangerous than the same measure applied once the disease has gained complexity. The following views and rules guide us in our treatment of this type of case, namely, the infectious conditions of the biliary system, gallbladder and ducts, liver, and pancreas:

1. Operation for the relief of biliary system disease is essentially an exploration; therefore it is necessary that the incision should be so situated and of such extent that visual inspection of the gallbladder and ducts is possible.
2. The appendix is more often at fault primarily than not, and should be removed except when acute peritoneal inflammation exists about the gallbladder, when all intra-peritoneal manipulations should be reduced to the minimum.
3. Removal of the gallbladder is indicated in all conditions in which it is diseased.
4. In selected cases the operative treatment is not complete until exposure and exploration of the common bile duct has been done, and conditions found therein properly treated; our rule for this additional procedure of exposure and exploration of the common bile duct is this: The common bile duct is to be exposed and explored in all cases, a, in which there is jaundice or in which there is a history of jaundice; b, in which there is associated pancreatic disease; c, in which the gallbladder is found to contain many little stones; and, d, in which stones can be felt in the common or hepatic ducts. The following cases illustrate the working of these simple rules:

CASE V.—S. L., an ironworker, thirty years of age. He had been a perfectly normal, healthy individual until the beginning of his present illness, without marked constipation, and never having suffered from indigestion. He was able to do his work without undue effort, and ate and slept well,—until a month ago. Present illness: A month ago the patient awoke with no more definite symptom than distaste for food. He went to his work without eating and continued without food for twenty-four hours, simply because of complete loss of appetite. At the end of this twenty-four hours he was seized with a severe pain in the pit of the stomach, had a sour taste in his mouth, heart-burn developed, and he began to belch gas. Six

hours later he vomited. He began to notice that his skin was discolored. He was compelled to take to his bed, and he remained there for three days in about the same condition, namely, with heartburn, pain in the stomach, belching of gas, and an occasional attack of vomiting. At the end of the third day he was able to leave his bed and call on his doctor. At this time he was markedly jaundiced. Under medication he improved somewhat but was never able to resume his work, and eventually—a month after the onset of the disease—he came to the hospital for treatment.

Examination revealed a man profoundly jaundiced, complaining of marked pain in his abdomen. He did not appear to be acutely ill. Abdominal examination showed that there was slight tenderness all over the right side of the abdomen, and over the epigastrium in the median line. The most marked tenderness was over the location of the pylorus. There was slight, but distinct, rigidity in the right upper quadrant. X ray examination gave no direct evidence of gallstones. The Wassermann was negative. Temperature was normal, and pulse varied between 64 and 90. At no time did his temperature rise above 99°, until after operation. Clinical diagnosis: Infectious disease of the biliary system.

Operation: a. Exploration; right transrectus incision over the gallbladder; the gallbladder itself did not appear to be the focus of trouble, there was no change in its color, no adhesions, and no thickening of its coats; there were no stones in the gallbladder. There were many enlarged lymph nodes about the head of the pancreas and at the junction of the cystic and common ducts; the head of the pancreas was large—as big as the clenched fist—soft and bulging forward through the encircling grasp of the duodenum. The neck and body of the pancreas were not enlarged; the foramen of Winslow was patent; the common bile duct was enlarged but did not show any inflammatory change; there was no fat necrosis and no effusion of fluid into the peritoneal cavity. b. Operative diagnosis: acute pancreatitis of the head. c. Treatment: The gallbladder was removed; the common duct was opened, explored for stones or debris, and none found; a No. 10 French catheter was sutured into the common duct and the abdomen was closed.

Postoperative course: The patient made a smooth operative recovery; drainage of bile reached its high point on the fifth day after operation when 600 c. c. were collected. During the next six weeks the flow of bile averaged about 300 c. c. a day, in addition to which amount a certain leakage into the dressings occurred. At the end of the third week the jaundice was imperceptible.

The next case serves to emphasize the early occurrence of infectious disease of the biliary system, and is reported for the purpose of again calling attention to the fact that disease of this system is not confined to middle life:

CASE VI.—Miss S. K., twenty-four years of age, born in Russia. This patient had been sick ever since she was six years of age; she had always had stomach trouble. She complained of fullness and discomfort after eating, especially after a meal in

which there was a large amount of meat. The sense of fullness and discomfort would come on immediately after eating and would last for about two hours. She had never suffered from constipation. From time to time she had suffered attacks of pain on the right side of the abdomen, these attacks having increased in severity and frequency in the past two years. Three months before admission she suffered an especially severe attack of abdominal pain and was advised to come to the hospital for treatment. Examination: The patient was anemic and rather thin. There was no marked abnormality except in the abdominal region; here there was marked pain and tenderness along the entire right side of the abdomen, with a slight amount of muscular defense; distinctly tender spots were discovered over the region of the appendix and the gallbladder. Her urine contained albumin and hyalin and granular casts. Temperature and pulse were normal. White blood count showed a total of 10,800 cells, seventy-six per cent. of which were polymorphonuclear. Diagnosis: Chronic appendicitis and chronic cholecystitis.

Operation: a. Exploration: Through an incision placed midway between gallbladder and appendix regions, and transrectus in type, both gallbladder and appendix were found buried in adhesions. These adhesions by their attachment to the hepatic flexure and to the caput coli, respectively, markedly limited the normal motility of the colon. b. Operative diagnosis: Chronic appendicitis and chronic cholecystitis. c. Treatment: Gallbladder and appendix removed after a clean dissection of the surrounding adhesions. The abdomen was closed about a drainage tube, No. 30 French, leading down to the duodenorenal recess.

Postoperative course: The patient's recovery was decidedly stormy for a few days, and there was some drainage of bile from the wound for about ten days. Following the removal of the tube on the third day her condition improved and she left the hospital well on the road to complete recovery.

We have observed drainage of bile from the wound in a certain small percentage of our cholecystectomy cases in spite of the fact that care is always taken to tie off the cystic duct close to its junction with the common duct, and always separately from the cystic artery. Drainage of bile unquestionably comes from the blowing off of this ligature. We think it likely that this is the result of sphincterospasm at the lower end of the common duct, induced by the trauma of operation. It is of minor importance and except for the necessity for a few more dressings it does no harm. It is possible that the use of a drainage tube favors leakage from the stump of the cystic duct; we feel that the security afforded by the temporary drainage more than compensates for the annoyance of the occasional case which exhibits biliary drainage for a day or two.

CASE VII.—Mrs. I. S., born in Russia, thirty-two years of age. This patient was operated on nine months before admission to the first division of Fordham Hospital. Before this first operation she had complained of stomach trouble which had persisted for a number of years. She had suffered

from the usual type of fullness in the epigastrium after meals, belching of gas, and constipation. In addition to these symptoms she had suffered pain over the region of the gallbladder for the year previous to operation, and before this operation she had noticed a tender spot at the free border of the ribs to the right of the median line. Immediately following her operation she complained of the same pain and when she was eventually discharged from the hospital her condition was not improved. Examination: The patient was thin, anemic, and of sallow complexion. Her chief complaint was constant pain in one spot, over the region of the gallbladder, associated with persistent indigestion. There was a scar in the abdominal wall at about the level of the umbilicus, two inches in length. She said that the pain occasionally radiated to the groin and thigh. She had never been jaundiced, and had never had clay colored stools.

We, therefore, were faced with this proposition: A patient who had all the signs of chronic cholecystitis but who had been subjected to an exploratory operation only nine months previously as a result of which the operating surgeon had caused to be recorded that "gallbladder, duodenum, pancreas, and pelvic organs were all negative." We were moved to stick by our guns in spite of the findings at this operation, and subject this patient to reoperation for chronic cholecystitis. The determining factor lay in the scar of the previous operation; we felt that thorough and definite exploration of the condition of the gallbladder could not be done through a wound only two to two and a half inches long, and placed at the level of the umbilicus or a little above. In fact, we feel that in order definitely to rule out gallbladder disease the surgeon must see the gallbladder as well as feel it; palpation of the gallbladder and the ducts with the tips of the fingers may detect the presence of gross lesions such as stones, but will fail to detect the finer—but very definite and significant—signs of infectious disease, some of the most delicate, and significant, of which lie not in the gallbladder itself but in the contiguous peritoneum.

Operation: a. Exploration; the abdomen was carefully opened beside the old scar. A mass of adhesions firmly bound the small intestines to the parietal peritoneum; at its upper end this mass of adhesions, reinforced with omental grafts, involved the hepatic flexure of the colon and the edge of the liver, the upper right quadrant of the abdominal cavity being completely shut off from exploration by this mass of new formed tissue. In order to complete exploration of the gallbladder region it was necessary to resect these adhesions, and this was done, making use of sharp dissection and ligation where necessary. Coming down upon the edge of the liver in the gallbladder region it was seen that the hepatic flexure of the colon was firmly united to the liver at this point; in freeing these adhesions the edge of the liver was exposed and it was then found that a small process of liver tissue, about two inches in width, hung down over the gallbladder completely hiding it. This little canopylike process was turned upward and the gallbladder, the centre of a mass of adhesions, was seen. b. Op-

erative diagnosis: Chronic cholecystitis. c. Treatment: The gallbladder was freed of all adhesions down to the junction of cystic and common ducts; the cystic artery was ligated and turned aside, and the cystic duct ligated just above its junction with the common duct, and cut away. Tube drainage was introduced to the duodenorenal recess and the abdomen closed.

Postoperative course: Immediate operative recovery was satisfactory; the patient still suffers from some stomach trouble, and a little tenderness along the scar, together with vague abdominal pains. We do not feel that her progress is as rapid as we should like to see it but feel that we should not expect a quick and easy recovery in a patient who has been twice subjected to laparotomy within a period of a year.

It seems to be a more or less generally accepted opinion that it is very difficult to determine positively by palpation plus visual inspection the condition of the gallbladder, when the pathological condition of that organ is in a quiescent stage; is it not likely that a pathological condition of the gallbladder expressed only in perivesical adhesions of the cobweb type may be overlooked when examination is made only by palpation with the tips of the fingers, and through an inadequate incision?

The following case history indicates the value of the history in biliary system disease, and the comparative lack of value of physical examination.

CASE VIII.—Thomas C., thirty-eight years of age, a bookkeeper. His family history had no bearing on his present condition. His past history indicates that he had suffered from pulmonary tuberculosis in an active stage some three years ago. Present illness: For the past nine months the patient had suffered from loss of appetite, constipation, and pains in the abdomen. Nine months ago the first attack of abdominal pain occurred, and it had been repeated at various and irregular times. The duration of the intense pain had frequently been six hours. Vomiting had always relieved him. Two to three hours after meals had been the favorite time for the appearance of a painful attack. He had never been jaundiced, but had noted clay colored stools on several occasions. Physical examination: The patient was a rather slender, anemic male. There was nothing about his objective examination to indicate disease. Specifically there were no tender points, masses, or areas of muscular defense in the abdomen.

Operation: The appendix was chronically inflamed; it was removed. The gallbladder was surrounded by many delicate adhesions, and contained many small stones. The pancreas was normal, and the foramen of Winslow patent. The cystic and hepatic ducts were much dilated, and the common duct was at least a half inch in diameter. The common duct was opened, explored with a scoop and a small stone removed from the ampulla. The common duct was drained with a No. 10 French catheter, and the abdomen closed in the usual manner after the removal of the gallbladder.

Again the close association of the attending surgeon, the neurologist, and the orthopedist, proved of great value to the following patient:

CASE IX.—T., a boy of sixteen, injured his left elbow a month before admission to the hospital. The injury was treated as a dislocation, but function did not tend to return after reduction had been accomplished. He came to the hospital complaining of inability to extend the forearm on the arm, pain over the injured joint, and loss of sensation in the skin of the little finger and half the ring finger. Examination revealed a firmly fixed elbow. The forearm was held at an angle of 90° with the arm, and motion was limited to an arc of about 10° . The elbow was swollen and tender, especially over the inner aspect, and over the internal condyle of the humerus. Passive motion beyond the narrow limits mentioned produced much pain. The finger grip was also limited because of pain. Neurological examination (Dr. Joseph Byrne) indicated a partial division of the ulnar nerve. X ray examination (Dr. I. J. Landsman) disclosed an old fracture of the internal condyle of the humerus, with an absence of the epicondyle at its proper position, and the presence within the joint of a foreign body—probably the missing epicondyle. Dr. Byrne advised open operation with suitable neurorrhaphy. The orthopedist (Dr. S. W. Boorstein) also advised immediate operation for the correction of the ankylosis, the cleaning out of the joint cavity, and the early restoration of motion. In the meantime the Wassermann had proved negative.

Operation: A semicircular incision with convexity toward the radial side of the arm exposed the inner aspect of the joint. The ulnar nerve was recognized above the joint and was carefully dissected from its bed to a point corresponding with the extreme lower level of the joint: here the nerve was seen to be injured, a well marked fibrocystic mass occupying the nerve sheath at this point, the lesion not affecting the entire circumference of the nerve. Dissection of the nerve was carried out to a point about a half inch lower than the point of ganglion formation, and the nerve was gently drawn aside. The capsule of the joint was incised and the internal epicondyle found to be missing from its normal position. Investigation of the joint cavity proper disclosed the missing internal epicondyle lying between the articular surfaces of the humerus and ulna, with its articular surface looking upward and the line of fracture impinged upon the articular surface of the ulna. This little mass of bone was removed and the capsule sutured. The ulnar nerve was freed of all surrounding scar tissue, the little cystlike mass was punctured, and the nerve allowed to drop back into its normal position. The wound was closed without drainage. The elbow was fixed in marked flexion. Postoperative course; the patient made a smooth recovery, and primary union was secured. Active motion was encouraged on the eighth day, and passive motion and massage was added in a day or two. Dr. Byrne's examination showed that there was improvement in sensation on the tenth day. The patient was discharged from the hospital at the end of three weeks, improving in a satisfactory manner, and withdrew himself from observation at the end of about a month, well on the road to complete restoration of function.

The following case well illustrates the wisdom of close association between the attending surgeon and the members of the associated staff, especially the röntgenologist. We are indebted to Dr. I. J. Landsman for the careful and repeated x ray examinations of this case which enabled us to eventually clinch the diagnosis:

CASE X.—S. H., male, thirty-two years of age, married. His family history was not significant. He denied lues and there was no evidence, direct or otherwise, of such infection. He had never been operated on. His history as it bore upon the condition for which he came to the hospital was as follows: He had always been in fair health up to fourteen years ago; at that time he was seized with an attack of abdominal cramps, with obstinate constipation, but no vomiting. Ten years ago he had a similar attack, and again seven years ago. In the intervals between attacks he enjoyed moderately good health, though he was never robust. Since the attack seven years ago he had had occasional attacks of vomiting. About two years ago he showed symptoms of pulmonary tuberculosis and since that time he had never been well. Eight months ago the patient had an attack of abdominal cramps that lasted for three weeks. Seven weeks ago he had a similar seizure, and in this attack the pain radiated to the back on the right side; this pain recurred at irregular intervals throughout the day, each attack lasting about five minutes. He always had the pain if he went any unusual time without food, and he had moderate comfort for about one hour and a half after his meals; the pain had a tendency to localize in the right iliac fossa. During this period of seven weeks he had repeated attacks of vomiting, had persistent sour taste in the mouth, had gaseous eructations, and had been obstinately constipated. He says that he never had a satisfactory movement of the bowels, cathartics and enema being used continually. In this latest attack he had great difficulty in urinating; he found that he was not able to void while standing, nor while lying upon his back or right side—it was necessary for him to lie upon his left side in order to void, and even then urination was difficult and painful. Since the beginning of this latest attack the patient had lost sixteen pounds. Examination: His appearance was that of a chronically ill individual who was suffering from a distinct toxemia; he was emaciated, and the conjunctivæ were blanched; his skin was moist—wet, in fact—with a clammy sweat, and his eyes were unnaturally bright, and the mucous membranes of his nostrils and lips were a brilliant carmine. His mental condition was dull. His lungs showed the evidence of chronic inflammatory disease in a quiescent stage. There was nothing noteworthy about the extremities. The abdomen was markedly distended symmetrically, and there was a general tenderness. Two masses were discovered, one of these about the size of a baby's head and the other a little smaller; these masses were very hard to the touch, slightly tender; the smaller one was rather freely movable, not connected with the larger one, but superimposed upon it; the larger mass was firmly fixed just above the symphysis pubis, a little to the right of the median

line; rectal examination showed that this larger mass almost completely filled the pelvis, and could be moved slightly by pressure from within the rectum, through the rectal wall. Cystoscopic examination was impossible because of the firm impaction of this larger mass in the pelvis. Examination of the urine disclosed perfectly normal urine—quite clear.

Shortly after admission the patient's temperature rose to 104° and the pulse to 108. After catharsis and the use of the enema the temperature returned to normal, although the amount of the bowel movement was slight and no gas was passed.

The x ray examination: The first examination was made at a time when the more movable mass was in the region of the right kidney, and the plates showed what appeared to be a very large calculus in the right kidney. Reexamination disclosed a very large mass in the pelvis, the more movable of the two masses having deserted the kidney region and come to lie in close contact with the larger mass, in such a way as to cause the blending of the two shadows. In view of the urinary difficulty experienced by the patient and because of the density of the mass and its position, it appeared that we might have to deal with a very large vesical calculus; however, the bladder was filled with collargol and the patient reexamined, when the mass was clearly shown to lie outside the urinary tract. By a process of exclusion the diagnosis was arrived at. Operation: Median hypogastric incision; as soon as the peritoneum was opened a tremendously dilated and hypertrophied sigmoid came into view, within which lay the tumor; an attempt was made, by working from within the abdomen and against the fingers of an assistant's hand within the rectum, to break up the mass, but this was found to be impossible both because of the hardness of the lump and because the finger within the rectum could not reach it. The sigmoid was incised in the anti-mesenteric line and a huge enterolith turned out. A second, slightly smaller, enterolith was removed from the afferent loop of the sigmoid, and several smaller rocklike pieces of fecolith were removed from the portion of the sigmoid immediately below the primary mass. Firm lockstitch suture of the sigmoid wound was made and a row of Lembert stitching covered the watertight stitch. The empty sigmoid was seen to be in a state of very active peristalsis. The peritoneal toilet was completed and the abdomen closed with a drainage tube led down to the sigmoid wound. Postoperative course: The patient reacted well from the operation. There ensued suppuration in the abdominal wound. Movement of the bowels was very sluggish and unsatisfactory, and we were convinced that the toxic condition, noted before operation, was entirely unchanged by the operative relief of the mechanical condition from which he had suffered. At the end of ten days the suppurating wound in the abdominal wall was improving, but the patient's general condition did not improve; at no time since operation had there been any vomiting. When the patient's temperature eventually arrived at normal, and the pulse dropped to 60, it was apparent that, while the bowels were moving fairly well, the patient was suffering from

the accumulated toxins of months of obstipation. This patient was removed from the hospital in the fifth week of his convalescence, and two weeks later died in another institution. The cause of death was apparently this peculiar toxic condition from which he suffered, and which persisted unchanged after the condition which had called it into being had been disposed of.

17 WEST SEVENTY-THIRD STREET.
217 EAST 116TH STREET.

CELLULAR THERAPEUTICS,

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The disabled cell.—The cell is the unit of altered structure and disordered function. No treatment can be rational which does not consider the cell because the sum total of physiology and pathology is but the aggregate of cellular physiology and pathology. Cellular wellbeing is health; cellular disability is ill health. The relative seriousness of the symptoms, signs, complications, sequelæ and termination of any disability will be directly proportionate to the importance of the functions which the affected cells normally perform.

The physiological needs of cells.—All cells need, 1, a constant supply to the cells of reparative and building material and kinetic energy (furnished as dissolved digested food and oxygen), chemical messengers from the endocrine glands and internal secretions and antitoxins. This is the duty of the arterial blood stream. 2. A constant flow from the cells, draining off excess of blood (thus preventing stasis) whereby wastes and formed products (the result of their life activity and special function) are removed. This is the duty of the lymph channels and the venous system. 3. A coordinating government by vibratory messages from the cerebrospinal sympathetic system.

Rational therapeutics regards the cell and its activities and considers the appropriate treatment to remove disabling causes and restore the relationship outlined above, viz., opening the channels of blood supply to the disabled cells; opening up the channels of drainage from them, and controlling the nervous messages. Rational therapeutics goes even farther. It assists the individual cells to throw off their incubus, spew out their poison, and absorb kinetic energy and reparative and building material, thus renewing their accustomed relation to the rest of the body.

Nature has but one remedy—blood. Blood is the *vis medicatrix naturæ*. Nature's effort is always to afford the disabled cell an increased blood supply. If we employ this agent we follow Nature and the cell, if viable and not crippled, will then build itself up and resume its function, if crippled it may be helped by therapeutic agents acting directly on and in the cell; if dead, the leucocytes will remove the corpse.

If Nature were always successful in her effort, no therapeutic assistance would be required. The body would be its own physician in great as well as in small disabilities, but unfortunately in the desire

to protect the injured cell and to restore continuity and function, deplorable results occur which may be seen in any clinic and most frequently among those races or creeds whose therapeutic knowledge and skill are primitive or nonexistent. Examples of these failures of Nature are: spontaneous amputation, necrotic sphacelus, abscess, intestinal adhesions, bony deformities following fractures, ankylosis following injury or inflammation of joints, cardiac hypertrophy, hob nail liver, pancreatitis, nerve atrophy with loss of motor and sensory function, neuromuscular cripples from neuritis, toxic goitre, uremia from nephritis following toxemia, or diarrhea, etc. Warned by these unhappy results we try to avoid Nature's mistakes in our efforts to aid her.

THE BASIS OF THERAPEUTIC PROCEDURE.

In making our choice of agent or method we should ask ourselves the following questions, the answers to which will be our guide in selection and application of our treatment: What cells are suffering altered function? What is the nature of the alteration? What are the causes of the altered function? How would Nature restore the cells to normal function? What aid does Nature need to bring about the normal function and what agents have we with which to afford that aid? Which of our agents is preferable? What degree of restoration to normal is attainable?

Proceeding in this manner we may find ourselves considering any of a thousand and one pathological conditions, but all resolving themselves into cellular disability, altered blood supply, impaired drainage. It is true that surgery relocates the dislocation, replaces the broken ends of fractures, transplants tissues to restore function and continuity, removes harmful growths, drains toxic abscesses, restores mechanical ability and relieves pressure, but surgery is only a special branch of therapeutics and must in the last analysis consider the cell, which is the agent to complete the restoration of continuity and function, and the blood supply, the *sine qua non*. Surgery is always a violence done to repair a violence or prevent a violence.

NATURAL THERAPEUTIC AGENCIES.

To supply affected cells as well as all cells with the life giving, life maintaining blood, Nature employs the following combination of agencies working in harmonious balance: Cardiac integrity and rhythm; vascular continuity and permeability; lymphatic continuity and permeability; normal blood constituents, which in turn depend upon adequate qualitative and quantitative diet; alimentary adequacy to convert diet into soluble kinetic energy and reparative and building materials; pulmonary respiratory exchange and capacity; renal, dermal and pulmonary excretion; endocrine balance between pituitary, thyroid, adrenals, and gonads; and periodical removal of waste residue from diet; and, finally, automatic (or reflex) cerebrospinal sympathetic control and coordination including special sense organs functions.

When this combination of agencies gets out of proper balance we have first the cells immediately disabled and then in coordinating series other cells which they control or with which they are associated

in bodily functions which may, and usually do, create a vicious circle whose point of creation we must discover.

CLASSES OF DISEASE.

There are only two general classes of diseases: Class I, diseases not transferable (noninfectious), and, Class II, diseases transferable (infectious).

The causes of the first class are: Inherited anomalies; poisons ingested, inhaled or absorbed; traumatisms, mechanical, thermal, electrical; and disregard of the physiological needs of the body as an organism whereby the harmonious relations of the agencies mentioned above are destroyed or hindered. The second class has the first class as a predisposing cause and live parasitic plants and animals as its exciting cause.

THERAPEUTIC AGENTS WHICH REMOVE DISABLING CAUSES OF CLASS I.

1. Exercise: This includes developmental, corrective and remedial exercise.
2. Dietetics: This comprises a chemical and physiological consideration of foods; rations adopted to work, curative and restorative diets.
3. Heat: This includes, a, convection heat obtained by hot water baths, electric hot pads, hot packs, hot water bottles, hot air, hot mud, vapor and shower baths; b, penetration heat obtained by light baths, diathermy, induction, condensation and monopolar high frequency d'Arsonval, Tesla and Oudin currents, brush and spark static current; c, convection cooling or abstraction of heat by cold immersion, ice baths, cold packs, Scotch douche, needle shower, sea baths.
4. Vibration: a, Mass vibration obtained by massage (manual and mechanical); b, tissue vibration obtained by faradic and sinusoidal electricity; c, cellular vibration obtained by actinio (spectral) light; high frequency alternating and oscillating electricity (d'Arsonval, Tesla, Oudin) in the form of induction, condensation, bipolar and monopolar application, static electricity in the form of wave current, induced current, spark, spray, brush and breeze, röntgen ray and radium ray.
5. Antitoxins and vaccines.
6. Opothrapy: The use of glandular substances, glandular extracts and glandular active principles as well as the use of drugs directly affecting the activities of the endocrine glands.
7. Surgery.
8. Galvanism: Dissimilar and characteristic effects of positive and negative poles.
9. Drugs, including ionization by galvanic current.

AGENTS AFFECTING CELLULAR PHYSIOLOGY.

1. Static electricity; the wave, induced, spark, spray, brush and breeze.
2. Bipolar indirect; Tesla or d'Arsonval high frequency current using the effluve, spark or vacuum tube.
3. Direct bipolar application causing thermal penetration at any degree up to incineration according to electrode used.
4. Monopolar high frequency—Oudin current.
5. High frequency condensation and induction.
6. Light rays: Krohmyer or Hanovia lamp or low power Mazda lamps.
7. Röntgen and radium rays.
8. Drugs which can be carried by ionization, with a galvanic current, and
9. Opothrapy.

THERAPEUTIC AGENTS WHICH REMOVE THE DIS-
ABLING CAUSES OF THE SECOND CLASS OF
DISABILITIES BY BEING BACTERICIDAL
WITHIN THE LIVING TISSUES.

Röntgen ray and radium ray; light, especially ultraviolet rays; d'Arsonval and Tesla bipolar (indirect and direct); Oudin current; galvanic positive electrode; antitoxins and vaccines, and antiseptic drugs, especially when ionized by the galvanic current.

USE OF PHYSICAL AGENTS.

The physical agents mentioned are directly indicated in cellular therapy, but to employ them successfully requires an intelligent acquaintance with the physics of each form as well as their physiological effect, and this also implies a thorough knowledge of the technic, that is, the machines and apparatus, their dose and mode of optimum application, to obtain the desired therapeutic effect.

These physical agents have been much neglected because of the failure of medical schools to ground their students in the science of physiology and the art of gymnastics, the science of nutrition and the art of dietetics, the science of electricity and the art of electrotherapeutics, the science of vibration and the art of massage (molar, cellular and molecular), the science of radiant energy and the art of phototherapy, röntgen therapy, and radiotherapy.

This neglect has led our fraternity into the camp of the pharmaceutical nihilist, and expectant treatment which is but one step removed from absent treatment and mental healing. It has led us to look askance at what we did not understand and be satisfied to see the irregular practitioner seize upon these agents as his peculiar field and call himself by a new name. It has permitted medicine to hand over to surgery many conditions which should never require the knife. It has made gynecology almost synonymous with surgery.

Cellular therapeutics demand the use of these agents. It will be impossible to make therapeutic stabs in the pathological dark when we turn our attention to cellular physiology and cellular pathology because we will practice cellular therapeutics.

The cell is the unit of altered structure and disordered function.

CHOLESTEROL THORAX

Report of a Case.

BY JOSEPH H. BARACH, M. D.,
Pittsburgh, Pa.

Since cholesterolin is at most only infrequently found it will not be amiss to review without too much detail what is generally known about its occurrence in the body. It is defined as a monatomic unsaturated secondary alcohol or a complex terpene; its chemical formula is said to be $C_{27}H_{46}O$. It occurs in small amounts in nearly all fluids and juices of the body; in the blood and lymph it exists as a fatty acid ester; in the bile it exists in a free state. Cholesterinemia occurs when there is obstruction to the free flow of bile into the intestines. It is especially abundant in the brain, nerve tissues,

and semen. It appears in the contents of the intestine, in the excreta and in meconium. Ordinarily it is not recognized in the tissues, but under certain pathological conditions necrotic and degenerative crystals are found. They occur in atheromatous areas of the aorta, in arcus senilis, retinitis, atheromatous cysts, in pus, in sputum, in tuberculous masses, old transudates, in tumors undergoing necrosis, in xanthomia (xanthomia tuberosa multiplex occurring about the joints), in gallstones, in old inflammatory processes of the tunica vaginalis and testes with hydrocele, in fluid long retained in a shut off gallbladder, and in old pericardial effusions. From the sites enumerated above, it may readily be seen that in certain locations following the accumulation of fluid, if that fluid remains stagnant for a sufficient length of time, a deposit, or a crystallization of cholesterolin, may occur.

The fluid of cholesterol thorax may be mistaken for chylous or pseudo-chylous fluid if one were to rely upon the macroscopic appearance of the fluid. True chyle will show a fat content of about ten per cent. and small fat globules, while pseudo-chylous fluid will have a fat content of about one half of one per cent., and its fat globules are much larger. Whereas the chylous fluids are milky in appearance, the cholesterol fluids are more of the color of butter.

CASE.—Mr. J. H., aged sixty-seven, a native of Ireland, a laborer, was admitted to my service in the medical ward of the Presbyterian Hospital on December 8, 1919. He had just recovered from a right apical pneumonia. His history revealed the fact that his last illness had occurred thirty years ago, prior to his coming to this country. At that time he suffered from an attack of pleurisy, with which he was ill for two months. Since that time he had worked regularly for thirty years, and did not recall that he had experienced any physical discomfort.

Physical examination revealed a poorly nourished man, with marked arcus senilis; his radials and other superficial vessels contained numerous atheromatous areas and were of pipe stem hardness. His cardiac dullness was increased to the right, left border extended 10.5 cm. from the median line. Epigastric pulsation was prominent. No murmurs could be detected. The first diagnosis was chronic myocarditis, but later events warranted our giving up this diagnosis. When the effusion was removed, the heart settled down to a simple sinus irregularity and showed no evidences of myocardial deficiency.

Examination of the lungs showed that his right apical pneumonia had not completely resolved. On the left were found the usual physical signs of pleural effusion. This diagnosis was verified immediately by aspirating. His temperature for two days had been not over 100° F., his pulse rate 90-100, but his respiratory rate was 32-40. He had leucocytosis and lymphocytosis. The aspirated fluid, which presented the physical appearance of pus and was entirely odorless, was sent to the laboratory for culture. The following report on the examination was wholly unexpected: No pus cells, no bacteria, sediment consists of rhomboid crystals—cholesterin.

The following day, with an aspirator we removed

450 c. c. of this fluid, which gave the patient considerable relief. Two days later physical examination revealed a characteristic metallic tinkling and other evidences of pneumohydrothorax. This was verified by fluoroscopic examination. His condition did not change much and twenty days later, owing to a reaccumulation, we removed 960 c. c. of fluid of the same character. After this he steadily improved, and was walking about two weeks later. At no time did we find evidences of a lung abscess or a tuberculous infection.

The history and course of this case suggests a latent pleural effusion with precipitation of cholesterol, and after the first aspiration, a reaccumulation of serum. The fistula from which metallic tinkling occurred was probably produced by removal of the fluid which had acted as a support to the atelectatic lung. I have previously explained how metallic tinkling is produced (1). That the lower lobe of the left lung was collapsed was seen at the fluoroscopic and radiographic examination.

To the naked eye the fluid in this case appeared to be light yellow in color, of the shade of butter. Upon standing, it separated into two parts, the lower half being fatty, and the upper being a slightly opalescent straw colored fluid. Microscopic examination showed no fat globules, no pus cells, and no bacteria. The only visible constituents were the characteristic rhomboid cholesterol crystals. The reaction to Benedict's solution for sugar was negative. The fluid showed no changes after standing twelve months.

Two cases of cholesterol in pleural effusions were recently reported by Sharpe (2). The first case occurred in an adult, thirty-four years of age, who had an encysted pleural effusion with a straw colored fluid, containing some cells. The cells were polynuclears eight per cent., endothelial fifteen per cent., and lymphocytes seventy-seven per cent. After aspiration the patient recovered and worked for six years. In the seventh year he had a recurrence of symptoms referable to the chest, and aspiration showed a fluid free from cellular elements containing many cholesterol crystals. The sputum showed tubercle bacilli.

The second case occurred in a male child who at the age of two years had an empyema. Seven years later symptoms developed and a left pleural effusion was diagnosed. One and a half pints of spangled fluid were removed. One month later the patient was again tapped and fifty-six ounces of fluid containing cholesterol crystals were removed. At a third tapping two pints of pus were removed.

Alexander has also reported a case of pericardial effusion in which the fluid had the appearance of gold paint, produced by cholesterol crystals. The patient was a male, aged thirty-two, who had been complaining of symptoms for the past five years, which were diagnosed as hypothyroidism. Superimposed upon these were cardiac symptoms of a few months' duration which led to the diagnosis of a pericardial effusion. He was discharged from the hospital after six weeks and resumed his work. Thirteen weeks later he was readmitted, his pericardium was aspirated and three pints of scintillating gold paint were removed. At the end of

two months the patient left the hospital free from symptoms.

Comment.—One thing stands out clearly in the cases here cited, and that is, in not one of them did the cholesterol deposit occur at the time of the primary attack upon the diseased part. The deposit or precipitation of cholesterol crystals occurred in inflammatory exudates within serous sacs, following the subsidence of acute inflammatory processes. The cases cited show that the antecedent history of a deposit of cholesterol may be five or as long as thirty years.

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UNDERLYING FACTORS IN GOOD POSTURE.*

BY C. WARD CRAMPTON, M. D.
Battle Creek, Mich.

Gravity is continually pulling down the human body. The erect position of man makes him peculiarly subject to its influence. He is balanced upon a small base and must necessarily keep his balance lest he fall. At various places in his anatomy there are joints which must be kept from bending too far, for the more nearly vertical the body is held, the less force need be exerted to hold it erect. The ankle, knee, hip and the whole spinal column up to the cranium must be kept in balance with the superincumbent weight squarely above. The contents of the trunk are more fluid and tend to flow downward. They also must be held up against gravity.

Bad posture is essentially a ptosis or a group of ptoses. Ptosis is a downward displacement or depression of the various body parts. It is found in the drooping of the head, shoulders, ribs; frequently in the depression of the stomach, intestines, and other abdominal organs; in forward, backward and lateral curvatures of the spine. Any of these gives the body an appearance of sagging downward. There are four kinds of ptosis; skeletal, visceral, circulatory and emotional. They are more often found associated than singly. Each symptom evidences a condition which is the result of low vitality and which in turn tends to cause low vitality, thereby establishing a vicious circle.

TYPES OF PTOSIS

Skeletal ptosis is the downward displacement of bones, and is shown in the drooping of the head, the exaggeration of the normal curves of the spine, the falling in and down of the chest. These cause a decrease in standing height as compared with horizontal length, a comparison which is a definite test of poor skeletal posture. The less the decrease in the standing height, the better the posture. Skeletal ptosis is caused by weak tone, or the relaxation or chronic weariness of the muscles which hold the body erect. It is the natural adjustment of the body to fatigue.

*Address of Temporary President of the Association of Institutions Giving Normal Instruction in Physical Training delivered at Waldorf-Astoria, New York City, April 10, 1920.

Visceral ptosis is the downward displacement of the internal organs and is usually accompanied by skeletal ptosis. It may be local, that is, one organ only may be displaced; or general, in which case the whole body contents sag downward. In the latter case the chest is flattened, its capacity is decreased, and the abdomen becomes protuberant, the lower ribs often bulging. It is the result of constitutional inferiority, low vitality or bad habit. Its presence may be ascertained by percussion of the organs to determine their position, by the use of the x ray and by comparing the girth of the chest and the abdomen.

Circulatory ptosis is the downward displacement of blood and its collection in the abdominal veins and arteries. The splanchnic veins in the abdomen form the most capacious system of blood vessels in the body, and if they are relaxed and distended, a large amount of the blood which should be in other parts of the body drains into them. In the erect position, these vessels continually work against the force of gravity. They are kept from distention by the contraction and tone of the muscles in their walls, which are under sympathetic nervous control, and by the contraction and tone of the walls of the abdomen. If there is an insufficiency of nervous control or if the abdominal wall is weak, permitting relaxation, the resistance to the pressure of gravity is lessened and ptosis results.

An emotional ptosis is a depression of the spirits. The terms dejected, depressed and downcast are all derived from descriptions of physical states. By racially old practice and habit these expressions are applied to emotional states and refer to unpleasant feelings of the asthenic type. Other more or less colloquial terms are downhearted and down-in-the-mouth. These terms, descriptive of emotional ptosis, derived from physical conditions, indicate the correlation between the mental and the physical.

CORRELATION OF PTOSES

All four ptoses as a rule occur together. Any one of them tends to cause the others but the relation of ptoses to each other is not primarily that of cause and effect. They are related to each other mainly as effects of a common cause, to wit, lowered vitality.

Ptoses are likely to occur after illness, a period of loss of sleep, chronic digestive disturbances and the like. Therefore, ptoses are not to be removed permanently without the removal of the common cause, i. e. lowered vitality—the very term in itself expressing a ptosis. There are, however, various other influences which bear upon the case.

Hereditary maladjustment.—The biological causes of bad posture are disharmonies, which correspond to the same forms of ptosis. These are due to the fact that evolution has brought the body from a posture of locomotion on all fours with the trunk horizontal, up through gradual stages to the posture with the trunk erect. The body has not yet sufficiently adapted itself to the change, and the various disharmonies remain.

Skeletal disharmony.—The head, instead of being in the long axis of the body, has rotated ninety degrees to this axis. It is kept erect by muscular force only and tends to go forward and downward if

the muscles are weak. Of the changes in articulation, the hip changes and neck changes are relatively well adjusted. The arch of the foot presents a skeletal disharmony of the worst type; the weight of the body comes on the arch, which was never meant for that purpose. Frequently the arch breaks down, causing flat foot.

Visceral disharmony.—In the old horizontal position of the trunk, the internal organs hung from their attachments to the spinal column with sufficient room and in proper interrelationship. In the erect position they hang from the rear rather than from the top of the abdominal cavity. The intestines are heaped in the bottom of the abdominal chamber and constipation and auto-intoxication result. The contents of the chest rest upon the diaphragm, which in turn presses upon the intestines. The abdominal wall tends to relax, allowing the

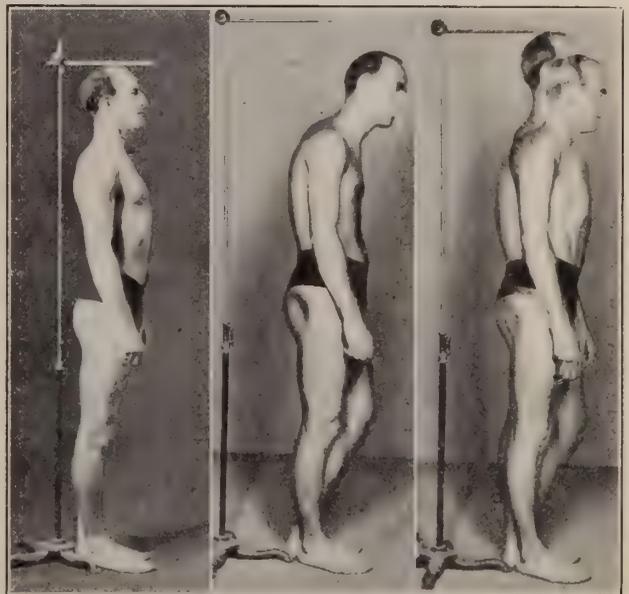


FIG. 1.
Good Posture. Poor Posture Good and Poor Posture

whole body contents to sag down upon the pelvis and causing the abdomen to protrude. The best that can be done to relieve this condition is to keep the chest raised and, by means of strong lower abdominal muscles, to keep the intestines from crowding down.

Circulatory disharmony.—Our physical machinery is relatively weak because of the change of position from the horizontal to the erect. Because it is recent biologically, it is easily wearied, and allows the blood and lymph to go down in response to the influence of gravity. Circulatory disharmony is evidenced in the difficulty that is experienced in getting the blood returned from the feet up to the right side of the heart. This is accomplished by the action of the leg muscles, the contraction and tone of the muscles of the abdomen, which helps to force the blood upward and the suction of the chest (aspiration of the thorax), which lifts the blood out of the abdomen and delivers it to the heart. Circulatory ptosis is relieved by increasing the tone and contraction of the abdominal walls, and by raising the chest, which increases the thoracic aspira-

tion, but most of all by increasing the tone and vitality of the muscles in the blood vessels of the abdomen by hygienic measures.

Lack of vitality or tone.—Anything that causes lower vitality, anything that works against health, and anything that works against happiness, increases the tendency toward bad posture. Bad posture is not so much a cause of low vitality as it is a sign or expression of past or present physical or mental depression. If the person is sick or hurt, the skeletal muscles lose tone and the body droops; if the mind is dejected and low spirited, the physical attitude corresponds to the mental state. Body and mind are depressed together.

Posture and efficiency.—It has been established by statistical tests that physical or mental defect or weakness is related to poor posture. The average record of pupils in the poor posture group has been found to be appreciably lower than the good posture group in attendance, in deportment, in physical activity and endurance, in manual training, and in commercial success after leaving school. It is clear that anything that lowers vitality causes bad posture. To what extent bad posture causes poor vitality is not accurately known. It is certain that by assuming good posture, raising the chest and head, one feels better. This is partly psychological and partly due to an actual improvement in the circulation of the blood.

Limitation of corrective measures.—In the endeavor to correct bad posture by removing causes which result in ptosis, nothing can be done about hereditary disharmonies, and little is possible in resisting the influence of gravity, except the seeking of proper rest and the habitual assumption of corrective positions; but in overcoming the third factor, lack of vitality or tone, physical training finds its great opportunity.

The essentials of tone.—The body is kept erect by bones, muscles, and ligaments. The muscles keep the bones and ligaments in position. Thus, if the muscles are strong and in good tone, they will hold the body parts up properly, the posture will be good, the trunk erect, the chest up and the head held high. These are the signs of vitality. On the contrary, if the vitality is low, the body yields to the influence of gravity and relaxes. Muscular tone continually works against this influence. It is dependent upon muscular training and upon the power of the nervous system which presides over the nutrition of the muscles. This applies to both the skeletal muscles and the muscles of the veins of the abdomen which control blood ptosis.

The muscular element in muscular tone:—1. The nutrition of the muscles which keep the trunk erect, chest high and abdomen flat in a large part determines their tone and their success in doing the work for good posture. Hence, good food, fresh air and the like are fundamental to good posture. 2. The actual strength of the muscles is important, for they must be kept in a state of semicontraction, holding the body straight and its parts adjusted and high. The stronger they are, within reasonable limits, the better. Hence, they must get sufficient special exercise. 3. The muscles which hold body parts in good position against gravity must acquire the structural

habit of being short, for lengthening means giving way, and permits their loads to droop and fall to lower positions. Muscles tend to assume the state in which they are most used; hence, if we desire short muscles, we must exercise them in a shortened state. Thus, we use exercises in which the movement is confined to the proximal (nearest to the trunk), third or half of the arc or movement, and in this we emphasize complete contractions of the muscles we desire to shorten.

The nerve element in muscular tone.—Muscular tone is a continual unnoticed contraction of the muscle which, though practically static, is really due to nerve impulses flowing to the muscle along the motor nerve at the rate of twelve to twenty impulses a second. These impulses come from the motor cells in the interior of the spinal cord and are vigorous or weak according to their nutrition and the amount of fatigue. When they are well nourished and fresh, the muscular tone is good. When they are overcome or exhausted, the muscular tone is correspondingly poor. Hence, nutrition and rest have an increased significance in posture.

When the motor nerve is cut or the motor cells are destroyed by disease, as in infantile paralysis, the muscle loses its tone, becomes weak and anemic and ceases to grow; it becomes atrophic. This proves that the motor cells preside over the nutrition of the muscles, sending them continually what is called the trophic force. This indicates again the rôle the nervous system plays in muscle condition.

The important little muscles surrounding the arteries and veins are supplied with nerves coming from centres in various parts of the body called sympathetic ganglia, and are dependent upon them in much the same way as the voluntary muscles are dependent upon the cells of the spinal cord. Since these muscles control the distribution of the blood, and particularly prevent blood ptosis, the condition of the sympathetic nervous system is of great importance.

The digestive glands—the liver and the pancreas and the muscular walls of the stomach and intestines—are all directed and managed by the sympathetic nervous system. Thus the nerve centres direct processes upon which they themselves depend for nourishment.

The photographs of the excellently built young man should be studied carefully, for they illustrate the important points in the discussion of posture. The photographs were taken within a few minutes of each other. The subject remained standing with his feet in the same place. The only difference is in his slumping from good posture to bad. The cigarette is included because the bad posture produced is a perfect representation of that pose of chronic lassitude, the effect of excessive cigarette smoking.

The decrease in total height amounts, in this case, to four and a half inches. This is not the result of bending the knee, for the right leg is just as straight as it was in good posture. The decrease in height comes from the slumping down of one side of the pelvis, the increase in the curves of the lumbar, dorsal and cervical spine.

The illustration shows clearly the downward dis-

placement of the different parts of the body, which, summed up, make the difference in the total height. The head is downward, tilted forward, hanging heavily upon the posterior neck muscles instead of being evenly poised on the cervical vertebræ. The shoulders go downward. It will be seen, however, that they do not go forward, but the chest rolls downward under the arm, and the back protrudes outward. Notice the whole downward displacement of the chest and the disappearance of the line of the lower ribs.

In good posture the outline of the body from the neck downward over the abdomen is convex, particularly over the thorax. In bad posture this line is concave except for the slight projection of the pectoral muscles. The chest in good posture is deep, the abdomen slim. In bad posture the contents of the abdomen simply drop downward and cause a bulge at the lower waistline. The two photographs clearly show the difference in aspect. The one posture is high, straight, elevated, inspired and strong; the other lax, depressed, downcast and weak.

HOW TO GET GOOD POSTURE

1. *Description.*—In our endeavor to get good posture, children should be informed in a lively interesting way as to what it is. Emphasis should be placed upon the high head, lifted chest, straight back, etc., choosing words which will be of use afterward as elevation cues. Little time, however, need be wasted upon description for the most important thing for the people to know is how it feels to stand in good posture. Before the class, the teacher should demonstrate the various points contrasting the good high erect posture with the lowered poor posture.

2. *Demonstration.*—The teacher of physical training experiences the greatest difficulty in making his pupils understand just why their postures are wrong, and furthermore what kind of effort they should make to correct the bad postures. This was the great fundamental difficulty in the endeavor to get school children to stand up straight. They had been told to stand up straight, but did not know how. Usually they threw the shoulders back and in an endeavor to throw the chest out, stick out the stomach, drawing the hips forward, stiffening the arms straight down to the sides like pokers. This is wrong.

3. *Experience in good posture.*—There are various devices used to put children in good posture. The first one is the use of commands called elevation cues because they are calculated to work against postures. The most important of these are as follows: Stand tall, head up, head high, lift the head, stretch the head upward, chest high, and lift the chest.

Waist flat, lift the waist up, stretch the knees, lift upward from the ankle, and stretch the body upward—all these cues result in increased action of the muscles which keep the body erect. Additional colloquial adjurations may be used by the teacher such as, "try to make the head touch the ceiling," "stand as if you were looking over a fence," "pick up your ears," "make believe you are a soldier," "grow up tall," etc. The commands "chest out," "shoulders back," "hips back," "chin in" and others calling for anterolateral adjustments are discarded.

Words alone will not bring results. A pupil who cannot take correct posture exercises may be stood up with back against the wall and a book placed upon his head. Feeling the wall on his back he will straighten up and try to be as tall as possible. Placing the hand on the abdomen and pressing in and up will help him decrease the lumbar curve. Stretching the arms down at the side, still keeping the shoulders and hips back against the wall will help him straighten up taller.

Once good posture is obtained, a pupil should leave and go about his ordinary business, sitting, standing, working or exercising, but always maintaining the high head and chest position. A full length mirror in which pupils can see their defects and finally their good posture, is valuable to good posture work. Every well equipped gymnasium should have a double or triple mirror permitting the pupil to see himself in profile.

STATIC EXERCISES

The use of the wall and the mirror confine the teacher's attention to the individual. There are certain static exercises which may be used for the whole class. These were the only good posture exercises which I put into official use for all of the eight hundred thousand children in the public schools of New York city, not because there are not other good exercises but because these are the simpler and most effective. It has been found when these exercises are taken there is, by the process of association, a

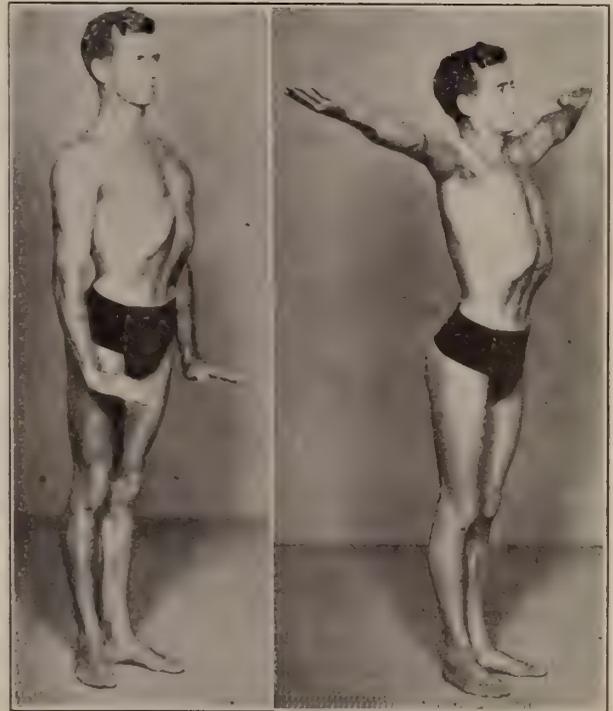


FIG. 2.

Static Exercise No. 1.

Static Exercise No. 2.

straightening up of the body. It is necessary, however, to use them correctly.

Exercise 1.—Stand erect, stretch the arms downward at the side, pointing the fingers forward, bending the hands back on the wrists so the palms are horizontal to the floor. When you have assumed this position, the exercise has only begun. It is

necessary for you to press down as hard as possible toward the floor, still maintaining the hands in exactly the same position, in the meanwhile lifting the chest and head and endeavoring to straighten up as vigorously as possible. This will raise the chest, lift the head and stretch the body most effectively.

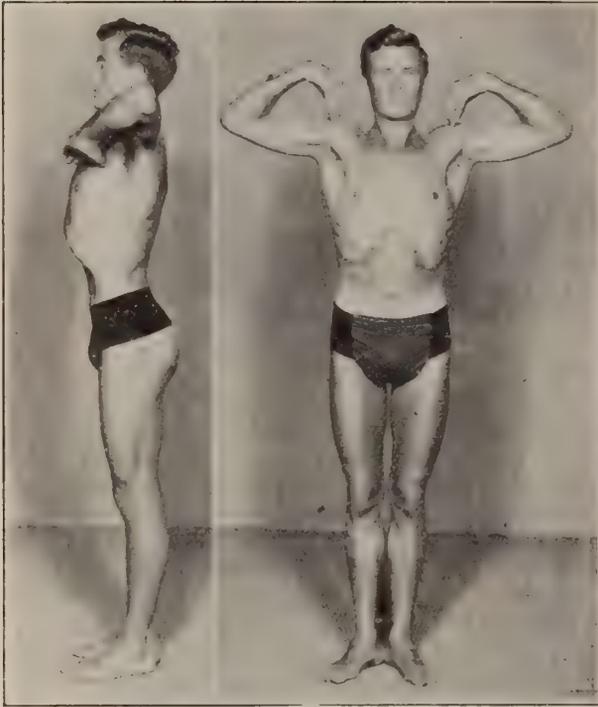


FIG. 3.

Static Exercise No. 3.

Static Exercise No. 4.

This position should be held from five to ten seconds. The hands and wrists are then released, and the body should remain erect and poised high. The body should never be allowed to slump.

When the initial position is taken, there is a tendency to take a full breath and to hold it during the whole of the exercise. At the end of exercise the tendency is to let the breath out and to slump again. The subject should practice breathing in and out in this upwardly held position. In giving this exercise to children it is necessary to give them helpful upward stretching commands when the position is held. These are stand tall, raise the chest, press down on the hands, stretch upward from the ankles, stretch the knees, and the like. These elevation cues are quite as important to the success of the procedure as the actual exercise itself.

Commands.—1, Bending wrists backward, palms toward floor, bend; 2, Press hard! Push down! Lift the chest. Stand tall; 3, Holding the head and chest up! wrists—Relax.

Exercise 2.—Raising the arms sideways, palms turned up at the level of the eyes. In this position the hands are flattened and pressed up, lifting the arms, at the same time trying to stand as tall as possible, lifting the chest and stretching upward from the ankles and knees.

Commands.—1, Stretching arms sideward height of eyes, palms up—Stretch! 2, (Elevation cues.) Lift! Press up! Stretch up! Stand tall! 3, Keeping head and chest up; arms—Down.

Exercise 3.—Bending arms forward at shoulder level. Palms should be perfectly flat and hands free from the chest. The same endeavor should be made to lift the hands as high as possible, and this will lift the chest and straighten the body.

Commands.—1. Bending arms at shoulder level—Bend; 2. Elevation cues; 3. Keeping head and chest up, arms—Down.

Exercise 4.—Finger tips on shoulders, wrist high, elbows to the side. In this position an effort should be made to lift the wrists as high as possible without permitting the finger tips to leave the shoulders. The same results are obtained, lifting the head and chest and straightening the body.

Commands.—1, Finger tips on shoulder, wrist high, elbows up,—Place; 2, (Elevation cues.) Raise the chest. Lift the head. Stretch up. Waist flat. Lift up the waist; 3, Keeping head and chest up, arms—Down.

These static exercises should be used at the beginning of every physical training lesson and in the relief exercises taken between class periods. Emphasis should be placed on the elevation cues while the uplifted position is being held. They not only lift the head and chest but they actually lift the abdominal viscera and relieve blood ptosis as well.

The second class of good posture exercises are those which strengthen the muscles that hold up the head, chest and various body parts against gravity. In order for one to have good posture, these sustentacular muscles should be constantly exercised and strongly developed.

(To be concluded.)

THE CAUSE OF ASTIGMATISM.

BY GEORGE EDWARD BARNES, M. D.,
Herkimer, N. Y.

What is the cause of ordinary astigmatism? Examining eyes for glasses is one thing that I do not do, so I have little opportunity to investigate this problem. However, I have an idea which I believe is correct. Judging from the history of patients, astigmatism often appears at the same time when more or less general ill health appears. When ophthalmologists find astigmatism in patients' eyes it seems to be the prevailing opinion that the patients have always had it and that they have only recently been bothered by it.

Undoubtedly some cases of astigmatism date from the earliest days of life, but I do not believe by any means that all cases do. Intelligent patients observe a sharp transition from many years of perfect and comfortable vision to a time of blurred and uncomfortable (astigmatic) vision. They state on being questioned that their general health became somewhat impaired at the same time. This is most significant. Any sickness which directly or indirectly affects the sympathetic and autonomic nervous systems (1) may directly or indirectly alter the tension of the eyeball and thereby change its curvature. Chronic emotional disturbances (1) through the sympathetic and autonomic nervous systems affect the general blood pressure, which in turn affects the ocular tension and these emotional disturbances also affect the activity of

Mueller's muscle. I have never seen or heard it stated that the general blood pressure had any influence on the ocular tension, but it seems to me that it must have. I believe it is of prime importance as a factor in determining this tension. Furthermore, the condition of the general circulation influences the fullness of the blood vessels in the orbit and thus influences the pressure exerted on the eye by the tissues surrounding it and therefore affects its curvature. The general circulation and general health also influence the amount of fat in the orbit. It is plain that the effect of the action of the extrinsic muscles on the curvature of the eye varies somewhat with the extension of the eyeball.

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A CASE OF ERYSIPELAS WITH COMPLETE LOSS OF VISION

Cured and Vision Restored.

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A patient with erysipelas of a severe form complicated with loss of vision was admitted under the care of my predecessor at the B. D. Petit Parsee General Hospital on December 9, 1919. The patient was a female, aged twenty-eight years, very poorly nourished, having had continuous fever for ten days with a large patch of erysipelas on the external surface of the right thigh. The heart sounds were feebly audible; pulse weak and of low volume, with slow and shallow breathing, with normal liver and spleen outline. There was total blindness of both eyes, one eye having been sightless from infancy and the other affected only a few days after her present illness. This patient, who was delirious at times, was treated on ordinary lines with anti-streptococcic (erysipelas) serum injections in large doses. In all about eight injections were given, together with appropriate local treatment.

When the patient came under my care for treatment on October 1, 1919, she was in an extremely bad condition, highly anemic, prostrated, with the heart sounds feebly audible. She had a rapid, weak pulse combined with low muttering delirium. The spleen was normal, but the liver was greatly enlarged and tender. A further dose of twenty-five c.c. of antistreptococcic serum was given and the patient was put on a simple mixture of iron and given brandy in liberal doses as a stimulant. The temperature, which had been 99.6° F., rose after three or four days, and at the same time there was a marked increase in tenderness in the hepatic region. Emetine injections of a quarter grain were given every day for three days. After the third injection of emetine the temperature dropped to

normal. Pain and tenderness in the liver disappeared and the patient was a trifle better. Three more injections were given and the fever remained below normal. During this period the only drug that was administered to the patient by mouth was liquor ferri perchloridi several times a day. The blood picture showed, instead of a leucocytosis, a marked leucopenia, which is very unusual in such diseases, with the red blood cells 2,020,000 to the c.c. and a few microcytes. There were no other changes in the blood. About eight days after the complete fall in temperature, large abscesses suddenly developed on the face of the patient, in both the arm pits and on the buttocks. Autogenous vaccine was prepared and four injections were given. This prevented the development of further abscesses and inhibited the ripening of those already formed. There were no other pyemic complications. About ten days after this the vision of the patient improved. The leucopenia was less marked. On November 2, 1919, the patient told me that she could then see things as well as she used to before her illness. During all the time that she was under my care, she was kept on a mixture of iron which was given in increasing doses. It was due to the iron that her vision was restored and her general health improved so quickly. Though the antistreptococcic serum, the autogenous vaccine and emetine each played their own part against the infection and its pyemic complications, her recovery was due to the iron.

CONCLUSIONS.

1. No case of loss of vision in erysipelas has been recorded as far as I know.
2. The vision was completely restored under a simple treatment of a mixture of iron.
3. Hepatic and pyemic complications yielded rapidly to emetine and autogenous vaccine treatment.
4. Exceptionally quick and complete recovery was due to the iron, which acted as a specific more than the other drugs which were used.

The patient left the hospital in perfect health.

289 HORNBY ROAD, FORT.

Quinine in the Treatment of Hemoptysis.—

Joseph E. Strobel (*Medical Record*, August 21, 1920) reports favorable results from the administration of five grains of quinine every four hours for a week in cases of hemoptysis. Assuming that the theory of mixed infection was the correct explanation of hemoptysis, Strobel injected into fifty-four rabbits subcutaneously one half a cubic centimetre of fresh bloody sputum from as many different patients during different seasons of the year. The result was that in fifty-one of the rabbits lobar pneumonia and pneumococcic septicemia developed, in two a localized tuberculous abscess, and in one an abdominal abscess. Five of the fifty-one rabbits were controlled by a rabbit of similar weight receiving a similar inoculation but to which had been given fifteen minutes previously one grain of quinine bisulphate intravenously. These controls were killed after two to three months, presenting all organs and blood free from tubercles and diplococcic pneumonia.

Editorial Notes and Comments

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THE NEW HYGIENE.

The human organism might be defined as a collection of habits (or memories if we use Butler's expression). The production of germ cells is a habit and a strong one; the whole process of development is a habit influenced to some extent by surrounding conditions; the business of feeding and sleeping and getting about and of fighting bacteria are other habits, more modifiable but still habits which become more and more fixed with years. Illness is brought on by mistakes in attempts to establish new habits beyond the capacity of the organism, as in the attempts to overfeed or overwork or under-sleep. It is comparatively easy to see what has gone wrong and usually the sick themselves are aware, but there is a wide range of habit within which the organism can persist for years and it is the course of bad habits of mild degree which slowly kill or slowly injure and which it is the realm of personal hygiene to correct. But habits, being fundamental to existence, are exceedingly difficult to change once they become established. Function makes structure and structure reacts to fix function and make it tyrannous.

The new method of teaching hygiene, fortunately, is based upon an early establishment of healthy habits—not by telling what they are, but by seeing that they are established. It is surprising how few the fundamental habits for health are, and how simple to establish as compared with those developed by other school work. The school, therefore, which fails to make the teaching of hygiene by the new

method an essential part of its course is deserving of strongest condemnation. It must be remembered that the public school child has already spent from four to six years in the formation of habits, in many instances more or less bad from the beginning. The results of medical inspection have made clear the effect of bad habits of the child growing out of bad family habits or customs. The pediatricist, the family physician, and the welfare nurse, are the most important teachers of hygiene because they preside at its source. The welfare of the nation will depend to a large extent on the skill of these workers in properly starting the human machine.

THE PHYSIOPATHOLOGY OF THE TENDON REFLEXES.

According to the recent researches carried out by Lhermitte there are two theories applicable to tendon reflexes; the old one, according to which these have a mesocephalic origin—the cutaneous reflexes being cortical—or more correctly have their centre in the nucleus ruber. Crocq and Van Gehuchten maintain that the preservation of the tendon reflexes is dependent upon the rubrospinal tract, whose origin is the nucleus ruber, the ending point of the superior cerebellar peduncles. Whenever this tract is morbidly disordered the tendon reflexes are also abnormal. This theory is directly related to the opinion upheld by Jackson and Bastian, according to which the cerebellum and cerebrum exercise an antagonistic action on the cord, the cerebrum having an inhibitory action, the cerebellum a tonic one. Now, how is it possible to explain by these hypotheses an increase of the subjacent tendon reflexes which occurs after experimental division of the cord? In point of fact, complete division of the cord, so frequently observed during the recent war, has shown that from this viewpoint only secondary differences exist between man and animals, and that in the former, in cases of medullary division the tendon reflexes are exaggerated, sometimes even accompanied by spinal and patellar trepidation, as observed by Lhermitte, Claude and Roussy.

In reality this phase of exaggeration—immediate in animals—is tardy in man and appears to be preceded by shock; therefore, the reflexes are abolished in the paralyzed segment of the body, so that this absence has as origin the inhibitory action of the medullary wound on the spinal segments separated from their upper connections. Consequently, the centres of tendon reflexes are medullary and not mesocephalic. As to the cutaneous reflexes, it is

known that they consist of reflex contraction of a given muscle following a mild stimulation produced on the cutaneous surface. According to the classic textbooks, they have cortical origin, while Van Gehuchten maintains that they are abolished in many cases and preserved in animals with a complete division of the cord. Here again the war has shown that it is erroneous to compare men with animals in respect to their cutaneous reflexes. All observers who have studied complete revision of the cord in warfare have noted that the cutaneous reflexes remained and this immediately after receipt of the trauma and from the very onset of medullary shock. As to Babinski's reflex it varies, sometimes being absent, at others distinctly present. Generally it is associated with other reflex manifestations of greater interest as pointed out by Marie and Foix, viz., reflexes of medullary automatism.

Marie and Foix had previously demonstrated that in nontraumatic paraplegia the principal phenomena of muscle shortening could be made to reappear. The varied movements that Claude, Lhermitte and Roussy were able to demonstrate in their cases of total transverse division of the cord have a special significance because with one exception they represent the reflexes of the automatism of walking more marked in man than experimentally in animals. Babinski's phenomenon is related to movements of defense, and this would appear to apply as well to the visceral reflexes. The sphincters do not remain indefinitely paralyzed after total division of the cord because quite independently of the will they acquire in time an automatic action. It may, perhaps, be the same with the genital functions. But it would at present seem to be proved that all the reflexes—tendon, cutaneous and visceral—have a medullary origin.

INDUSTRIAL DIRT.

A new offensive is being launched against the twin enemies, disease and dirt. No section of labor brings more dirt home, or is more reluctant to avail itself of cleansing, than the coal miner; yet think what the providing of means for washing the man and his clothes means to the wife. The Board of Health in Great Britain is trying to establish pit-head baths for use at the end of the day. The difficulty is that, given all facilities, how many working men of any dirty occupation would care to take a bath save in a comfortable bathroom at home? To turn out again to get home sounds cheerful. Moreover, the old miner has a confirmed belief that washing the back has a weakening effect, and the elderly wives maintain bathing gives one a cold. The younger miners, fortunately, are becoming interested

in athletics and physical culture; the feeling, too, of self-respect is growing, the dislike of having to face clean people on the cars with dirty clothes and blackened exteriors is inclining them tubwards. It is easy to understand the objections to taking a bath away from home. Forty per cent. of the deaths in Welsh collieries are due to phthisis, pneumonia, and bronchitis, and an enormous number are due to rheumatism, lumbago, and sciatica. Also, some statistics made a few years ago in a Scotch colliery district showed eleven per cent. of the families had one room; sixty-five per cent. two, and twenty-four per cent. three; none had a bathroom. It was even worse in Yorkshire in 1919: 2,793 families lived in one roomed houses and 31,908 in two, and the water supply was deficient.

It all returns to the same issue: bad housing. The doctors, full of zeal, full of righteous anger, realize how they are handicapped and defeated every day by lack of cooperation on the part of employers. The details are rarely published in their actual sordidness, and, if published, would do no good unless some citizens, bold and brave enough, took up and hung on to the matter tenaciously to shame those responsible. Unaided, the doctor is made to feel bitterly his utter impotence, and the futility of urging obviously necessary reforms.

PHYSICIAN-AUTHORS: DR. ABRAHAM COLES.

One of the most famous American hymn writers was Dr. Abraham Coles, a staunch old Covenanter, who was born at Scotch Plains, N. J., on December 26, 1813, and died on May 3, 1891, at Monterey, Cal. (where he had gone for his health), after a distinguished career in the fields of literature and medicine. "Dr. Coles is a born hymn writer," said John Greenleaf Whittier, the Quaker poet. "He has left us a legacy of inestimable worth, some of the sweetest of Christian hymns. His *All the Days* and his *Ever With Thee* are immortal songs. It is better to have written them than the stateliest epics. No man living or dead has so rendered the text and spirit of the old and wonderful Latin hymns." Oliver Wendell Holmes, who, like Dr. Coles, was a physician, compared his hymns to the verses "which John Bunyan sprinkles like drops of heavenly dew along the pages of *Pilgrim's Progress*." Coles's hymns were praised with equal enthusiasm by Henry Wadsworth Longfellow, William Cullen Bryant, James Russell Lowell, William E. Gladstone, England's grand old man, and others.

Dr. Coles was a deeply religious man and through the large number of hymns which he wrote and

translated he promulgated his gospel of faith. He wrote poetry and prose of other sorts, too, but his fame is based primarily on his translation of the supreme product of Latin hymn writing, the *Dies Iræ*. Coles astonished the literary world a few decades ago with no less than eighteen versions of this masterpiece of hymnology, and they are among the finest of the one hundred and fifty or more versions of it in the English language. James Russell Lowell called them the very finest of all the translations. *Dies Iræ* originally was written in Latin by the monk Thomas of Celana, in Italy, in the thirteenth century. It is a chant of eight stanzas of eight lines each, giving a terrible description of the Judgment Day, painting in vivid colors the anguish of the self-condemned sinner and reciting his piteous appeals for mercy. "It is," Coles said, "instinct with music. It sings itself. The grandeur of its rhythm and the assonance and chime of its fit and powerful words are, even in the ears of those unacquainted with the Latin language, suggestive of the richest and mightiest harmonies." His eighteen versions of it show a surprising mastery of language and illustrate the possibilities of variation of language without alteration of the sense.

Coles also translated the *Stabat Mater Dolorosa* and the *Stabat Mater Speciosa*, and these, together with a collection of hymns under the title of *Old Gems in New Settings*, ran through several editions and are still standbys in standard hymnals. One of his most popular original hymns was *In the Sweet By and By*. He also translated from the Hebrew the *Psalms of David*, published with extensive historical and critical notes. His other writings included *The Light of the World*, and *The Evangel*, a life of Christ in verse, which Oliver Wendell Holmes called "charming and impressive" and which Whittier described as "a work of piety and beauty."

The Microcosm, a long poem which was written for the centenary anniversary of the Medical Society of New Jersey, of which Dr. Coles was president at the time, was published in 1881, together with his *National Lyrics* and *Miscellaneous Poems*. It took five editions to supply the demand for this book. George Ripley, one of the pioneer journalists of New York city, writing in the *Tribune*, described *The Microcosm* as "an ingenious attempt to present the principles of the animal economy in a philosophical poem, somewhat after the manner of Lucretius, and combining scientific analysis with religious sentiment." Dr. Coles always linked medicine and religion and regarded his profession as a sacred one. How loyal he was to that profession amid the glow of literary fame is shown in *The Microcosm*, a physician's edition of which was published.

Dr. Coles wrote a large number of medical and scientific papers which were published in various periodicals, and he also translated *The Address to Christ on the Cross*, by Bernard of Clairvaux, and Hildebert's *Address to the Three Persons of the Most Holy Trinity*, together with several selections from the Greek and Latin Classics. These, however, were not published.

When he was fifteen Coles became a clerk in a New York dry goods store and two years later he became a teacher of Latin and mathematics in the Bond Academy at Plainfield, N. J. At eighteen he studied law for a year and then definitely decided to make medicine his life work. He entered the College of Physicians and Surgeons, New York, and after studying there for a while, went to Jefferson Medical College, Philadelphia, where he received his degree in 1835. He practised mostly in Newark, N. J., and was prominent in civic and literary circles there. He served several terms on the Newark Board of Education, was one of the founders of the famous Newark Public Library and also of the New Jersey Historical Society. He made two trips to Europe, in 1848 and 1854, and was in Paris during those stormy revolutionary days of May and June, 1848, which gave him special opportunities for surgical experience and study.

This sturdy old Baptist doctor was one of the most lovable of men personally. "I have always considered it a privilege," said Oliver Wendell Holmes, "to enjoy the friendship of so pure and lofty a spirit; a man who seemed to breathe holiness as his native atmosphere and to carry its influence into his daily life." For his literary work Dr. Coles received the degree of A. M. from Rutgers College; the Ph.D. degree from Lewisburg University, and the LL.D. from Princeton University.

McGILL UNIVERSITY.

Of the twelve pamphlets published by McGill University, Montreal, in connection with the campaign now in progress for a five million dollar fund that entitled *A Greater McGill* is most interesting. In all its history that great university has made only three appeals to the public for assistance. The first was in 1881, when an appeal was made for thirty-three thousand dollars to save the university from a financial crisis. The second was launched in 1911 and brought the university a million dollars. Now the third is on for the amount stated above and the outlook is very promising. Part of the donations to be received will be set apart for memorial purposes as the donors stipulate. The war depleted the ranks of the professorial

staffs as well as the student body, and it is the desire of the governors that their names be perpetuated. During that stressful period no appeals for money were made. On the other hand, the strictest economy was practised in every department. No buildings were enlarged, but the whole policy of the university was one of retrenchment, even to carrying on with the old equipment and apparatus as in the days prior to the Great War.

In 1919 students began to return and more new ones were being admitted than ever before, until it soon began to appear that there was inadequate accommodation all round. Registration in arts sprang from 389 in 1918 to 632 in 1919; in medicine and dentistry, from 526 to 724; and in applied science, from 242 to 643. This large increase in attendance necessitated additional funds to provide competent professors and instructors. Prewar salaries, never great, under the changed conditions of living did not allow professors to live any better than many of the industrial classes. As the average salary of a professor at McGill is about three thousand dollars, the university needs at least a hundred and ninety-five thousand dollars to give living wages to a staff of about five hundred.

If the standard of the work of McGill is to be kept up additional professors must early be appointed and provided. Recently a new department of biochemistry has been established with Professor A. B. Macallum occupying the chair. Professor Macallum is a distinguished scientist, formerly in charge of the similar department in the University of Toronto, but latterly chairman of the Research Commission of the Dominion Government. There will be established shortly another new department in industrial chemistry.

For some time the accommodation for biological work has not been adequate. For that there is now available the sum of seventy-five thousand dollars. The old medical building will be used for this purpose, but the sum of a hundred thousand dollars will be needed for endowment. Then there is in view a new building to house pathology, medical jurisprudence, hygiene and psychiatry, to cost about four hundred and sixty thousand dollars and a further hundred and fifty thousand dollars for endowment. Without the five million dollars McGill would not be able to keep up its high standard, the equal of any other university on the continent of America, and to cover all its requirements no less amount than ten million dollars would begin to meet them. While it is true that McGill has in the past been most fortunate in many generous donations from friends, including Lord Strathcona, Sir

William McDonald, and the late Sir James Douglas, of New York, it was felt by the new president, Sir Arthur Currie, that this appeal should be made to a wide constituency so that the many graduates in Canada and the United States could have an opportunity to come to the assistance of their *alma mater*. The campaign is said to be progressing most favorably and the outlook is, therefore, most promising.

WOMEN WORKERS IN NOVA SCOTIA.

Working conditions of women in Nova Scotia have been under scrutiny by the Nova Scotia Commission on Women in Industry, which has recently issued a report. The general conclusions reached by the commission were that hours were frequently too long, especially where women have to stand or where work is heavy or unhealthy; that working conditions could be improved and should be subject to standard regulations; that the lack of medical inspection, especially in food factories, constitutes a public menace. It was suggested that a board be appointed representative of women workers, employers and the public, with power to secure improvement of conditions. Though the commission found that a large number of women were not earning enough to live on, it did not recommend a flat minimum wage but suggested that the proposed board be empowered to fix suitable standards from time to time.

MENTAL STARVATION.

Those doctors who have a pile of medical journals arriving every month, many of which they have not time to read, can hardly imagine the lassid feeling of the man far away from any library and too poor to afford the latest textbooks. Owing to the war, some of the physiological journals in India are dated 1915. The editor of the *Indian Medical Journal* has therefore resolved to devote a section to physiological science, and invites those who have new ideas and journals to fill it. Dealing food to the starving mind will meet with a rich reward in helping the all too few doctors for India's millions.

News Items.

Bequests to Hospitals.—The will of Henry Culver, of Southampton, L. I., contains a bequest of \$500 to the building fund of the Southampton Hospital.

Medical Society of the County of New York.—The annual meeting of the society will be held Monday evening, November 22d, in Hosack Hall, New York Academy of Medicine.

Whooping Cough in New York.—From January 1 to October 1, 1920, 6,602 cases of whooping cough were reported to the Department of Health of the City of New York. During the same period in 1919 only 827 cases were reported. Thus far this year 550 deaths have been reported, of which ninety-five to ninety-seven per cent. occurred in children under five years of age.

Public Health Affected by High Rents.—According to a report concerning housing conditions in Brooklyn, issued recently by the Brooklyn Bureau of Charities, many of the poorer families are living in such crowded quarters that their health is endangered.

Fifth Avenue Hospital Building Fund.—Recent contributions have brought the amount in hand up to \$1,045,800; the amount desired is \$2,000,000. The Barrymores, John, Lionel, and Mrs. Ethel Barrymore Colt, have given \$30,000 to endow a room in their name for the benefit of members of the theatrical profession.

The Police Hospital.—The first step in the campaign to raise \$5,000,000 to build, equip, and endow the proposed Police Hospital was a luncheon given by Police Commissioner Richard E. Enright to three hundred men of the theatrical and moving picture professions, at which \$75,000 was raised. The campaign for subscriptions will begin on December 9th.

Syracuse Academy of Medicine Meeting Postponed.—Owing to a death in the family of Professor Simon Henry Gage, the regular monthly meeting of the Syracuse Academy of Medicine has been postponed to November 23d. Prof. Gage will present at this meeting a paper on Free Granules of the Blood and Their Dependence on the Kinds of Food Ingested.

Low Death Rate for 1919.—According to the Census Bureau's annual bulletin on mortality statistics, 1,096,436 deaths occurred in the registration area of the United States during the year 1919. This represents a rate of 12.9 in a thousand of population, the lowest on record. The rate for 1918 was 18 in a thousand, due largely to the pandemic of influenza.

Research Information Bureau.—The National Research Council, of Washington, D. C., announces the establishment of a research information service as a general clearing house and information bureau for scientific and industrial research. Wherever possible information is furnished free of charge. All inquiries should be addressed to Research Information Service, National Research Council, 1701 Massachusetts Avenue, Washington, D. C.

Medical Supervision of Football.—The health aspect of football was discussed at a recent meeting of Brooklyn physicians. Dr. Robert E. Coughlin, who has made a study of this sport, considers it a dangerous pastime for boys of immature age and physical development. Others who spoke were Dr. Edward J. Grace and Dr. Earl Wayne, who pointed out that most of the injuries occurred in informal games where the players were not properly trained.

State Civil Service Examinations.—Among the positions for which the New York State Civil Service Commission will hold examinations on December 4th are the following: Assistant x ray operator, State Department of Health, \$1500 to \$1800; laboratory technician, County tuberculosis hospitals, \$900 to \$1500; resident physician, State institutions, \$2000. For full particulars and the proper application forms address the Commission, Albany, N. Y.

Academy Anniversary Address.—Mr. James M. Beck delivered the annual anniversary address at the New York Academy of Medicine, Thursday evening, November 18th, his subject being One Cause of the World Neuroses.

Gross Lecture.—Dr. Raymond Pearl, professor of biometry and vital statistics at the School of Hygiene, Johns Hopkins University, delivered the annual Gross lecture of the Pathological Society of Philadelphia, Thursday evening, November 11th, his subject being Some Biological Aspects of Human Mortality.

Typhoid Epidemic in Salem, Ohio.—An epidemic of typhoid fever has been raging in Salem, Ohio, for the past month, and has got beyond the control of the local authorities. There are approximately one thousand cases in the city, constituting one eleventh of the total population. Seven deaths have been reported. An appeal for help has been sent to the State authorities.

Drug Addicts Transferred from Sing Sing to Dannemora.—Twenty-nine drug addicts recently received at Sing Sing Prison were among seventy-six prisoners transferred to Clinton Prison at Dannemora. Some of these drug addicts, all of whom were suffering when received at Sing Sing, had to be treated in the prison hospital. Unable to get any drugs in Sing Sing, some of them had collapsed.

Patient Receives Fatal Shock from X Ray Machine.—While an x ray photograph was being made of his jaw, Casimir Ilg, thirty-five years of age, received a fatal shock in the office of Dr. Charles F. Baker, Newark, N. J. It is believed that the patient probably came in contact with the steel arm from which the x ray bulb was suspended, sending eighteen milliamperes of electricity through his body.

Personal.—Sir Berkeley Moynihan, professor of clinical surgery, University of Leeds, England, has been recommended for election to honorary fellowship in the New York Academy of Medicine.

Dr. Otto V. Huffman has removed his office to 25 East Sixty-fourth Street, New York.

Dr. William Delaney Thomas, of Baltimore, was elected president of the Homeopathic Medical and Surgical Club, at its recent annual meeting.

Charles Edouard Guillaume Breteuil, head of the International Bureau of Weights and Measures, was awarded the Nobel prize for 1920 for physics by the Swedish Academy of Science, recently. His discoveries relative to the alloys of nickel steel won him this honor.

Druggists Object to Dispensing Whiskey.—The Kings County Pharmaceutical Society, at a recent meeting, went on record as favoring the establishment of government dispensaries at which whiskey could be sold to people needing it for medicinal purposes. Dr. William Anderson, chairman of the legislative committee, reported that under the Volstead act retail druggists alone have the legal authority to deal out alcoholic stimulants. The society is opposed to having druggists deal in whiskey, even on doctors' prescriptions, and it was for this reason that the movement to have the Government undertake the work was started.

Antinoise Campaign in New York.—Health Commissioner Royal S. Copeland will soon begin an active campaign to suppress all unnecessary noises in the city of New York. An investigation of the automobile as a noise maker will be a part of it, and a survey of every motor vehicle in the city will be made, to ascertain how many of them are mechanically perfect. From now on the police will be instructed that on a certain day each week they are to give special attention to noises and their suppression. They will be expected to note the causes of noises, to report flat wheels, barking dogs, hucksters, etc. Noisy industrial plants will also be listed, and will be inspected with a view to stopping all unnecessary noise.

State Hospitals Overcrowded.—New York State's hospitals for the insane are overcrowded to eighteen per cent. above their normal capacity, according to the annual report of the State Charities' Aid Association which has just been issued. Institutions built to accommodate 30,324 persons now contain 35,845, and congestion brought about by the entrance of patients who must be admitted is causing a serious situation, especially in hospitals in and near New York city. These conditions are expected to be remedied through new construction provided for in state appropriations totaling \$5,000,000. Mentally disabled soldiers, now in various State hospitals, will be centred at the new State military hospital at Creedmoor, N. Y., when it is completed about next June.

Fatalities on the Railroads.—Fewer persons were killed on railroads during 1919 than in any year since 1898, and fewer were injured than in any year since 1910, according to a statement issued today by the Interstate Commerce Commission. During 1919 a total of 6,978 persons were killed and 149,053 injured, compared with 6,859 killed in 1898 and 119,507 injured in 1910. Of the killed 273 were passengers and of the injured 7,456 were passengers. Employees killed during the year numbered 2,138 and 131,018 were injured.

Fewer trespassers on railroads were killed in 1919 than during any year of the commission's records, which go back to 1890. Last year 2,553 trespassers were killed and 2,658 injured. Railroad officials pointed out that there were fewer tramps than formerly.

Ohio Public Health Association.—This organization has been formed for the purpose of promoting proper health administration in the State of Ohio. In addition to taking over the duties of the Ohio Society for the Prevention of Tuberculosis, its objects are to promote the organization of local public health leagues; the dissemination of knowledge concerning the prevention of disease, the encouragement and support of organized official work for the prevention of disease, the securing of proper legislation for the prevention of disease, encouraging adequate provision for the prevention of disease by the establishment of hospitals and dispensaries, etc., and the study of conditions regarding the prevalence of preventable disease. The work of the association is educational in character, and does not in any way encroach upon the functions of the state health department.

Yale University Department of Health.—The new department of health at Yale University is in complete operation. Drastic rules have been adopted to stamp out disease and illness of every kind which students, and especially athletes, may contract. Hereafter a general physical examination will be required of every student before he will be permitted to matriculate. Frequent examinations during the year will follow. Rigorous rules for athletes who wish to enter university sports will be adopted, and the health officials will reserve the right to order out of competition any athlete found unsound physically.

The board of health will be headed by Dr. Charles E. A. Winslow, Dr. William G. Anderson, Dr. Nelson Winternitz, new dean of Yale Medical School, and Dr. James C. Greenway. They will be assisted by George P. Day, treasurer for the university; Clarence W. Mendell, head of the Yale Athletic Council, and Professor L. E. Rettger, professor of bacteriology.

Meetings of Local Medical Societies.—The following medical societies will meet in New York during the coming week:

TUESDAY, November 23rd.—New York Academy of Medicine (Section in Obstetrics and Gynecology); New York Dermatological Society; New York Medical Union; Metropolitan Medical Society of New York; New York Otolological Society (annual meeting); New York Psychoanalytical Society; Therapeutic Club; Valentine Mott Society; Washington Heights Medical Society (annual); Clinical Society of the Hospital and Dispensary for Deformities and Joint Diseases.

WEDNESDAY, November 24th.—New York Academy of Medicine (Section in Laryngology and Rhinology); New York Society of Internal Medicine; New York Surgical Society; Brooklyn Pediatric Society.

THURSDAY, November 25th.—Hospital Graduates' Club of New York; New York Physicians' Association; Ex-Intern Society of the Methodist Episcopal Hospital, Brooklyn.

FRIDAY, November 26th.—Academy of Pathological Science; Audubon Medical Society; New York Clinical Society; Brooklyn Society of Internal Medicine.

SATURDAY, November 27th.—Harvard Medical Society; Lenox Medical and Surgical Society; New York Medical and Surgical Society; West End Medical Society.

Died.

BRONK.—In Amsterdam, N. Y., on Tuesday, October 2nd, Dr. E. F. Bronk, aged sixty-two years.

JAMES.—In Lexington, Ky., on Sunday, November 14th, Dr. Robert C. James, aged fifty-five years.

JOERG.—In Brooklyn, N. Y., on Thursday, November 4th, Dr. Oswald Joerg, aged seventy-six years.

PERKINS.—In South Otselic, N. Y., on Tuesday, November 2nd, Dr. Archibald T. Perkins, aged fifty-three years.

PRATT.—In Binghamton, N. Y., on Wednesday, November 3rd, Dr. John F. Pratt, aged sixty-four years.

WRIGHT.—In New York, on Monday, November 1st, Dr. T. S. Wright, aged eighty-six years.

WHITTEN.—In Peoria, Ill., on Sunday, October 31st, Dr. Thomas J. Whitten, aged seventy-six years.

WILLIAMSON.—In Santa Monica, Cal., on Thursday, October 21st, Dr. Alonzo P. Williamson, aged sixty-six years.

YOUNG.—In Amesbury, Mass., on Saturday, October 23rd, Dr. Benjamin Young, aged sixty-six years.

Book Reviews

LOOSE LEAF MEDICINE.

The Oxford Medicine. By Various Authors. Edited by HENRY A. CHRISTIAN, A. M., M. D., Hersey Professor of the Theory and Practice of Physic, Harvard University; Physician in Chief to the Peter Bent Brigham Hospital, Boston, Mass., and Sir JAMES MACKENZIE, M. D., F. R. C. P., LL. D., F. R. S., Consulting Physician to the London Hospital, and Director of the Clinical Institute, St. Andrews, Scotland. In Six Volumes. Illustrated. Volume I: Medicine; Volume II: Diseases of Bronchi, Lungs, Mediastinum, Heart, Arteries, and Blood. London, Toronto, Melbourne, Bombay, and New York: Oxford University Press, 1920. Pp. xv-817.

Two volumes of the Oxford loose leaf system of medicine have been published. The loose leaf system as applied to a publication of this kind is splendid, as it will allow for great flexibility. Changes that occur in one branch of medicine will not necessitate a complete new edition. In other fields where progress does not take place with the same rapidity the new pages will not be required so frequently. In a work of this kind two principal requirements stand out: first, the quality of the initial material presented, and, second, keeping the new sections abreast of the times. The first requirement has been met fully. In the first volume the subject of medicine is covered in a broad and understanding way. Two more progressive and able men could not have been selected as editors, Henry A. Christian, of Boston, and Sir James Mackenzie, of Scotland. A list of contributors, as a rule, makes dull reading, but in this case medical men who follow the work of achievement in modern medicine will recognize among the following list names of men who have prevented medicine from falling into the quagmire of mediocrity. So without apology we may name the following contributors: Lewellys F. Barker, Frank Billings, William T. Bovie, Richard Cabot, Joseph A. Capps, Henry A. Christian, Charles B. Davenport, Eugene F. Du Bois, Frederick P. Gay, Lawrence J. Henderson, Walter A. Hewlett, Guy Hinsdale, Walter B. James, William B. Johnston, Lucas P. Williams, Elmer V. McCollum, Sir James Mackenzie, Sir William Osler, John J. Mackenzie, Francis W. Peabody, Leonard G. Rowntree, Henry Sewall, Donald D. Van Slyke, William H. Wilmer.

The entire work is to consist of six volumes. The publishers feel that the change brought about by the war, in regard to the manner in which patients were handled and the new point of view gained by the medical men who were engaged in active work, should be emphasized in the medical works of today. This influence is noted in the first two volumes that have appeared. Sir James Mackenzie has been saying many very essential things in regard to medicine recently. His views are sane and have a tendency to induce the too theoretical practitioner who has his head in the clouds, or the practitioner who places too much reliance on laboratory findings, to come back to earth, stand on his own feet, and develop the faculty of relying upon himself. Too much cannot be said upon this subject. We have been too prone to remember the test tube and forget the patient. In his chapter on *The Future of Medicine* Sir James brings these points

home with great vigor. The first volume is replete with chapters as essential as those of Mackenzie's. They deal with problems ranging from those of focal infection to others of a forensic nature. These fields are well covered.

The second volume takes up the diseases of the bronchi, lungs, mediastinum, heart, arteries, and blood. Many new names are among the contributors of this volume; names that have appeared frequently in the current medical literature associated with the disorders of respiration and circulation. A great effort has been made to incorporate the latest findings and it is gratifying to see under the various headings the most modern views as they have appeared in the current literature. The project of the loose leaf system is not a fad. It should supersede the older forms of binding for works of this character. Fortunately, this effort is being made by men of repute and should meet with success.

EXPERIMENTS IN VITAL ENERGY.

Life. A Study of the Means of Restoring Vital Energy and Prolonging Life. By Dr. SERGE VORONOFF, Director of Experimental Surgery at the Laboratory of Physiology of the Collège de France. Translated by EVELYN BOSTWICK VERNOFF. New York: E. P. Dutton & Co., 1920. Pp. xx-160.

Frequently an attempt is made to present scientific works in an entertaining manner. At times success is attained. Fabre, in his descriptions of animal life, and the elder Darwin in his writings on plants and insects, and others, have been successful in combining literature, art and science, and at times have awakened an interest in topics which are usually presented in a dry and uninteresting fashion. Voronoff has attempted something similar in his near dramatic book, *Life*. He appears to be appealing to the gallery, crying aloud his wares and findings over the heads of the medical profession. Can it be that this is necessary?

He presents a few interesting findings and if they prove to be corroborated by further experiments in the hands of other observers no doubt will prove a boon to many who have neglected to make the most of life as they have found it; for others it will mean an opportunity of completing unfinished tasks. Truly the span of life of man seems short. The time he actually lives after he is equipped for life's struggle and after he has attained maturity of physical and mental development is brief. It seems but a fleeting moment that the race is run after the years of training and growth that man passes through in order to attain his adult status. Many other fields of application will also present themselves when the technic of glandular transplantation is perfected. A case is shown where the thyroid of an ape was successfully transplanted to a boy with beneficial results. The point made that the transplants should be made from man to man or from the animals more closely related to man is important. Too frequently in animal experimentation the error is made of using the lower animals and attempting to apply the results to the human family.

A definite result cannot be asserted at the present

time. More work must be done. Steinach, of Vienna, has many contributions to offer in this field which seem to be more far reaching than those of Voronoff. Lydston, of Chicago, has also done much work along similar lines. His papers have appeared in the *NEW YORK MEDICAL JOURNAL*. All of these men are undoubtedly the heralds of what will be an important therapeutic branch of medicine in the future.

PROGRESS OF SCIENCE.

The New World of Science. Its Development During the War. Edited by ROBERT M. YERKES, Chairman, Research Information Service, National Research Council. Illustrated. New York: The Century Company, 1920. Pp. vi-443.

Prowling around the second hand bookshops on Third Avenue, the reviewer came across many old volumes detailing the wonderful progress science had made, and it seemed that the title *New World* was a trifle arrogant, that the enlarging world would be more correct, for nothing has been sudden in discovery. The origin has lain far away back some hundreds of years. Glimpses they had, those old scientists, of possibilities, faith they had that knowledge has no boundaries. Nevertheless, the great tide of progress today astonishes us, awes us, sweeps us off our feet, destroys our conservative clinging to the old, lands us on eminences from whence we see all nations deserving recognition as the marvelous facts are garnered and used for man's help and delight.

Now that the war is said to be over, those in authority are showing us what a haggard, overworked, weary eyed servant science was. How she was referred to even in small matters, such as the amount of wool in military breeches, and the total of calories in a soldier's stew, how metallurgists and explosivists, bacteriologists, geologists, geographers, psychologists, radiotherapists, and physicists brought her their problems to solve and, war being ended, they gave her the biggest of all, how to avert another carnage, how to economize in and rightly use the new powers she had bestowed.

The first question should have been a just reward to the poorly paid scientist, whose incidental expenses often consume nearly all his income. There are scientists today who cheerfully gave their whole time during the war who find themselves worse off, financially, than the artisan.

Each section of the volume is a book in itself, increasing our feeling of indebtedness to those who have studied man and natural forces. A long list of familiar names tell us of deeds done: Ellery Hale, Robert Nillikan, Augustus Trowbridge, Herbert Ives, Harrison Howe, deal with the physical sciences. The rôle of chemistry has papers from Arthur Noyes, Charles Munro and Clarence West. Douglas Johnson records the wonderful, hitherto unknown, work done in geography, and equally good is the account of geology, though few associate its vital connection with wartime. Engineering is told by A. E. Kenelly; metallurgy by Henry Howe. Biology and medicine are safe with Vernon Kellogg, Frederick Russell, John Hanner, and Robert Yerkes.

To appreciate the medical and surgical side, it

would be well to read some of the books on those subjects during the Civil and the Crimean wars. It might be well also to read some of that date when the foolhardiness of risking one's life in a railway train was denounced in the pulpit, and the suggestion of gas illumined streets was greeted with derisive laughter in the House of Commons. At an annual picnic of the Philosophical Society, Benjamin Franklin jestingly said the society might some day cross the Schuylkill in an electric boat and dine off a turkey cooked by electricity. Rather a mad president, the guests deemed him, but the river is crossed, the turkey cooked, and incredulous old ghosts are convinced.

The people should be glad of this book. It gives in one volume that which has only appeared at intervals in scientific journals inaccessible to most. Even while the volume was in printing science has gone on still farther, lighting up obscurities, exciting her followers, and, fifty years hence, when the undreamed of has become the commonplace, the account of the *New World* will provoke even a smile for the scientists who only guessed at the marvels to be revealed before 1970. Even then, though disease may have its strongholds shaken, the Power which lets loose the fury of a tornado, an earthquake, a tumultuous flood, may see us still impotent before these forces.

THE HISTORY OF MEDICINE

An Introduction to the History of Medicine. By FIELDING H. GARRISON, A. B., M. D., Principal Assistant Librarian, Surgeon General's Office, Washington, D. C. Second Edition, Revised and Enlarged. Illustrated. Philadelphia: W. B. Saunders Company, 1917. Pp. vii-905.

Only those who have tried to write the history of any science can appreciate the immense amount of research in the first edition of this book; only those who know Fielding Garrison and his intense desire for accuracy, could be sure that in a second edition all which had provoked criticism as to correctness or omission would be rectified. One great attraction is the grouping, so arranged that any man wanting to know the stars in any particular science will find them under that heading, the difficulties of a man being eminent in two sciences, say, anatomy and biology, being obviated by his name being given under both. The fact that it is not a biographical volume permits the allusion to the work of many men still living, though the rapidity of time is somewhat sadly shown by men who, in the first edition had just a birth date, now appearing with two.

The most exigent should be satisfied with a medical chronology which extends from B. C. 7000 to 1914 A. D. It has also references for those wanting to study medical history, and an index of personal names and one of subjects. There are many pictures added in the new edition which give pleasure to those who have never seen some of the modern men. One of its best tributes is the fact that the reviewer mistook it for the first edition on the New York Academy of Medicine shelves when it had only been there three weeks: it already bore the traces of much consultation. And the men who had used it were perfectly safe in quoting it

as a reference. There is a report at Johns Hopkins Hospital that if you were to ask William Welch something on medical history while he was asleep, a correct answer would be given. Assuredly Fielding Garrison would stand the same test.

ANALOGIES

Our Great War and the War of the Ancient Greeks. By GILBERT MURRAY, LL. D., D. Litt., F. B. A., Regius Professor of Greek in the University of Oxford. New York: Thomas Seltzer, 1920. Pp. v-85.

Gilbert Murray, that most imaginative of scholars, who has recreated an interest in so much of Greek thought in his writings and his incomparable translations, has written a little book about two wars. He is ostensibly writing about the Peloponnesian War—the book purports to be “a study of the criticisms passed on the War Party at Athens by their contemporaries.” But one feels that for Professor Murray this study has been used to symbolize, to some slight extent, the hate and ferocity engendered by the world catastrophe just passed. His interpretation of affairs at Athens is too clear, too warmed by the *lacrimae rerum* to which he refers, for a hundred per cent. imperialist. He is a poet as well as a scholar, and he knows that history repeats itself.

The war between Athens and Sparta, as he shows, was “in many respects curiously similar to the present war.” It was a war primarily due to commercial rivalries, a fight to the last ditch, involving the attrition of both of the combatants. In the Athens of that day there were refugees and informers, militarists and rational persons; it was a war in which glory was mixed with sordidness, and in which the people who were responsible for the whole business suffered the least. And it left both Athens and Sparta ruined. Professor Murray sees the analogy clearly, but when it comes to the future outlook he is sympathetic, and disquieted, and hopeless. He hopes civilization will recover, but he is not entirely sure about it. He has a pathetic faith that by “some spirit of cooperation instead of strife, by sobriety instead of madness, by resolute sincerity in public and private things, and surely by some self-consecration to the great hope for which those who loved us gave their lives” things may be made better. But his faith is not the faith that moves mountains, and his last words are tinged with disillusionment: “That was the old dream that failed. Is it to fail always and forever?”

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

THE ADVENTUROUS LADY. By J. C. SNAITH. New York: D. Appleton & Co., 1920. Pp. 321.

THE NERVOUS HOUSEWIFE. By ABRAHAM MYERSON. Boston: Little, Brown & Co., 1920. Pp. 273.

CHARLES E. CHAPIN'S STORY. Written in Sing Sing Prison. With an Introduction by BASIL KING. New York: G. P. Putnam's Sons; London: The Knickerbocker Press, 1920. Pp. xv-334.

THE AGE OF INNOCENCE. By EDITH WHARTON. New York: D. Appleton & Co., 1920. Pp. 365.

OFFICIAL BULLETIN OF THE ROYAL SOCIETY OF MEDICINE. London: John Bale, Sons & Danielsson, 1920. Pp. 19.

LIFE. By JOHAN BOJER. Translated from the Norwegian by JESSIE MUIR. New York: Moffat, Yard & Co., 1920. Pp. 339.

THE STORY OF THE AMERICAN RED CROSS IN ITALY. By CHARLES M. BAKEWELL. New York: The Macmillan Company, 1920. Pp. viii-253.

A TEXTBOOK OF HISTOLOGY. By FREDERICK R. BAILEY, A. M., M. D. Sixth Revised Edition. Profusely Illustrated. New York: William Wood & Co., 1920. Pp. xviii-733.

PROCEEDINGS OF THE ROYAL SOCIETY OF MEDICINE. Edited by Sir JOHN Y. W. MACALISTER, Under the Direction of The Editorial Committee. New York, Bombay, Calcutta, Madras, and London: Longmans, Green & Co., 1920.

THE NEW WORLD OF SCIENCE, ITS DEVELOPMENT DURING THE WAR. Edited by ROBERT M. YERKES, Chairman of the Research Information Service, National Research Council. Illustrated. New York: The Century Company, 1920. Pp. vi-443.

MORALE. THE SUPREME STANDARD OF LIFE AND CONDUCT. By G. STANLEY HALL, Ph. D., LL. D., President of Clark University; Author of *Adolescence*, *Founders of Modern Psychology*, etc. New York: D. Appleton & Co., 1920. Pp. ix-378.

PHYSIOLOGICAL CHEMISTRY. A Textbook and Manual for Students. By ALBERT P. MATHEWS, Ph. D., Professor of Biochemistry, University of Cincinnati. Third Edition, Illustrated. New York: William Wood & Co., 1920. Pp. xiv-1154.

PATIENT'S HANDBOOK ON THE TREATMENT OF DIABETES MELLITUS. By THOMAS W. EDGAR, M. D., Author of *Psychology of Prognosis*, *Edgar Serum Treatment of Diabetes*, *Limitation of Starvation in Diabetes*. Boston: Richard G. Badger, 1920. Pp. 100.

A PRACTICAL MEDICAL DICTIONARY. By THOMAS LATHROP STEDMAN, A. M., M. D., Editor of the *Twentieth Century Practice of Medicine*, of the *Reference Handbook of the Medical Sciences*, and of the *Medical Record*. Sixth Revised Edition. Illustrated. New York: William Wood & Co., 1920. Pp. viii-1144.

LEHRBUCH DER MIKROPHOTOGRAPHIE. Von Dr. med. KURT LAUBENHEIMER a. o. Professor für Hygiene und Bakteriologie an der Universität Heidelberg. Mit 116 zum Teil farbigen Abbildungen im Text und 13 mikrophotographischer Aufnahmen auf 6 Tafeln. Berlin-Wien: Urban & Schwarzenberg, 1920. Pp. viii-220.

RELIGION AND HEALTH. By JAMES J. WALSH, M. D., Ph. D., Sc. D., Medical Director of Fordham University School of Sociology; Professor of Physiological Psychology, Cathedral College Lecturer on Psychology and Sociology, Marywood College, Scranton, Pa., Mt. St. Mary's, Plainfield, N. J. Boston: Little, Brown & Co., 1920. Pp. 341.

DIATHERMY IN MEDICAL AND SURGICAL PRACTICE. By CLAUDE SABERTON, M. D., Hon. Radiologist to the Harrogate Infirmary and to the Royal Bath Hospital, Harrogate; Late Hon. Medical Officer to the X Ray and Electrical Department, Royal Victoria and West Hants Hospital. With Thirty-three Illustrations. New York: Paul B. Hoeber, 1920. Pp. xii-138.

THE OXFORD MEDICINE. By Various Authors. Edited by HENRY A. CHRISTIAN, A. M., M. D., Hersey Professor of the Theory and Practice of Physic, Harvard University; Physician in Chief to the Peter Bent Brigham Hospital, Boston, Mass., and Sir JAMES MACKENZIE, M. D., F. R. S. P., LL. D., F. R. C. P., Consulting Physician to the London Hospital, and Director of the Clinical Institute, St. Andrews, Scotland. In Six Volumes, Illustrated. Volume II, *Diseases of Bronchi, Lungs, Mediastinum, Heart, Arteries, and Blood*. London, Toronto, Melbourne, Bombay, New York: Oxford University Press, 1920. Pp. xv-817.

Practical Therapeutics and Preventive Medicine

A Compendium of Treatment and Prophylaxis, Original and Adapted

Operation for Spinal Fusion.—A. Mackenzie Forbes (*Journal of Orthopedic Surgery*, September, 1920) gives the technic of his operation for spinal fusion as follows: A flap of skin sufficiently long to expose the area to be operated on is reflected from the concave side as in the Albee operation. The muscles on either side of the spinous processes are separated and retracted, exposing the laminae. The supraspinous ligament, the interspinous ligaments, and other tissues between the adjacent spinous processes are removed. In the case of the dorsal vertebræ the following additional steps are carried out. The spinous processes and laminae are so gouged by means of a concave chisel that their cortical layers are separated from the medulla beneath and a series of chips of bone and periosteum are pried up along the superior and inferior surfaces of these parts of the vertebræ. These chips of bone are made to interdigitate with each other thus similar cortical chips or digitations from the adjacent vertebræ are so apposed that the new bone thrown out from the raw surfaces of the exposed medulla will unite in one bridge or band extending from vertebræ to vertebræ. In other words, the laminae and spines in this region are in such close apposition that the interval between them is easily bridged by pushing the elevated fragments adherent to the periosteum alternately upwards and downwards from the laminae and spinous processes, thus making a form of connecting trellis.

Chronic Acid in Suppurative Dacryocystitis.—L. Chenisse (*Presse médicale*, April 24, 1920) describes a plan of treatment recently recommended by Vacher and Denis and which, it is stated, permits of maintaining patency of infected lachrymal passages and removes the necessity for surgical excision of the lachrymal sac. Thorough anesthesia of the eye is first obtained with five per cent. cocaine solution and the sac cleansed with boiled water introduced by means of a syringe and fine blunt needle into the lower lachrymal canal. A few drops of the cocaine solution, with adrenalin, are then injected through the same needle, and patency of the lachrymal passages ascertained by means of a No. 3 or 4 probe, left *in situ* for a few minutes. One third mil of a two per cent. or even a 3.33 per cent. solution of chromic acid is then drawn up into the syringe and injected slowly through the lower lachrymal duct, an assistant meanwhile introducing pure hydrogen peroxide solution drop by drop into the eye in order to neutralize the small amount of chromic acid solution which frequently flows back through the lachrymal passages. In sensitive patients one may supplant the ophthalmic anesthesia by spraying cocaine into the nose, a little of the caustic solution sometimes passing into the nasal cavities. The chromic solution is permitted to act for two or three minutes on the mucous membrane of the lachrymal passages and the treatment concluded by injection of a few drops

of hydrogen peroxide solution into the lachrymal sac. On the succeeding days the lids and eyes are washed with warm boiled water and the sac emptied by pressure at the inner angle of the eye. After a few days the lachrymal passages are examined for permeability and, if necessary, a permanent probe of silver wire inserted to restore it. Where the first chromic acid injection fails to yield perfect results the treatment is repeated once or twice, sometimes with stronger chromic solutions.

Blood Sugar Tolerance as an Index in the Early Diagnosis and Röntgen Treatment of Hyperthyroidism.—Eric R. Wilson (*Journal of Laboratory and Clinical Medicine*, August, 1920) studied the blood sugar tolerance in five cases of hyperthyroidism in young women between the ages of twenty-three and thirty-three, all unmarried. The determinations were made before röntgen therapy, after two series of röntgen treatments, and after the completion of three series of these treatments. As a result of this study the following conclusions are drawn: The blood sugar tolerance test is of distinct advantage in the early diagnosis of hyperthyroidism. That seemingly advanced cases of hyperthyroidism will respond moderately only to röntgen treatment, as shown by the blood sugar tolerance test. An abnormal blood sugar tolerance curve when due to hyperthyroidism will tend to approach the normal under röntgen therapy, indicating that excessive toxic secretion is lessened. Clinical manifestations of hyperthyroidism may be lessened, but an abnormal blood sugar tolerance curve may exist after series of röntgen treatments. The blood sugar tolerance curve is an index to thyroid hypersecretion in those cases in which toxic secretion has manifested itself by a decreased glucose tolerance.

Influence of Calcium upon Glycosuria.—A. G. Phocas (*Bulletin de l'Académie de médecine*, March 23, 1920), mindful of Fischer's assertion that calcium chloride removes glycosuria experimentally induced by sodium ions and of the known dynamic antagonism between sodium and calcium ions, was led to think that administration of calcium might be of service in some cases of diabetes. He gives brief histories of nine cases, in all of which the quantity of sugar passed was considerably reduced, or even glycosuria completely checked by this measure. In one of the most striking cases a sugar output of sixty grams a day was wholly arrested upon ingestion of calcium chloride for one week. The best preparation of calcium for these patients is asserted to be lime water, given in a daily dose of 100 to 200 mils. Preference is given to this preparation because its alkalinity may be of value in combating acidosis and in improving the patient's power to oxidize glucose. In fact, lime water is in one sense preferable to sodium bicarbonate as a general remedy for acidosis because the latter supersaturates the organism with carbon dioxide,

which acts as an obstacle to organic combustion. An excess of lime, on the other hand, tends to fix a certain proportion of the carbon dioxide set free in combustion, and may thus indirectly improve oxidation, besides controlling any overstimulation of the nerve cells due to the action of the sodium ions. The strict milk diet in diabetes probably acts, in removing glycosuria, by restoration of balance between the sodium and calcium ions. While reducing the sodium chloride in the system, the milk introduces a considerable quantity of calcium in the highly assimilable calcium compound it contains.

Syphiloma Vulvæ.—Arthur Stein (*Surgery, Gynecology and Obstetrics*, September, 1920) presents the following conclusions in regard to syphiloma vulvæ: 1. In conformity with modern knowledge and in the interest of a better understanding of the disease, all misleading names such as esthiomène or lupus vulvæ should be exterminated from the literature. 2. Syphiloma vulvæ correctly designates the disease as a manifestation of tertiary lues. 3. A positive Wassermann test is not essential in view of the long standing character of the specific infection in the majority of the cases. 4. The treatment under all circumstances should consist of, 1, operative removal of all tumors, hypertrophied tissues and ulcers, followed in the same session by, 2, energetic cauterization and combined with, 3, intensive antisyphilitic medication.

Plastic Surgery of the Ear.—Julien Bourguet (*Bulletin de l'Académie de médecine*, April 13, 1920) describes surgical procedures appropriate in various kinds of deformity of the ear. In cases of excessively large external ear a wedge shaped piece, extending through the entire thickness of the ear, is removed. If the upper portion of the ear then seems too broad, two additional wedges are taken out, the one above and the other below and perpendicular to the first. The raw margins are then sutured together. The lobule may also be reduced by removal of a triangular segment. Where the lobule alone is too long, a lozenge shaped section is removed and the lobule reduced to its normal size by appropriate suturing. Where the external ear is flat, having no helix, a crescentic skin incision is made on the anterior surface of the ear, four millimetres from the flattened margin, the cartilage exposed, and at a distance of three millimetres excision of skin and cartilage is performed without injuring the skin on the posterior aspect. The band of cartilage thus liberated from the main cartilage falls forward to form a curled margin and is sutured in proper position. In triangular ears a T shaped piece of tissue is removed and the margins sutured. Undue protrusion of the ear is corrected by removing opposite crescentic pieces of skin on either side of the furrow behind the ear and also a sickle shaped piece of cartilage, carefully avoiding injury to the skin on the anterior aspect; skin sutures are then inserted. Sagging ears are corrected in nearly the same manner, with the exception that in these cases a sickle shaped piece of skin of varying breadth is alone removed; the skin of the upper and lower margins is dissected up and then sutured, thus straightening the ear.

Production of Hemolysins by Injection of Salts of the Rare Earth Metals.—Frouin (*Paris médicale*, March 13, 1920) was able to cause the production of hemolysins by intraperitoneal injection in rabbits of salts of the rare earth metals. This process constitutes an example of the production of antibodies in the animal system without previous stimulation of a defensive reaction by the corresponding specific antigens.

Heteroplastic Bone Formation in the Fallopian Tube.—Goichi Asami (*American Journal of the Medical Sciences*, July, 1920) reports a case of aberrant bone formation in the fallopian tube. Cartilage was undergoing ossification and was surrounded by an organization tissue, some of which had been converted into an osteoid tissue. It is assumed that a metaplasia of the connective tissue occurred with the formation of cartilage and the production of bone, but how it was done is left unexplained.

Arthroplasty of Knee Joint.—Putti (*Journal of Orthopedic Surgery*, September, 1920), from a report of ten cases of arthroplasty of the knee joint, gives the following as the lessons learned: 1. Complete removal of all intraarticular structures is necessary. 2. The knee operated upon is usually larger than the other from hypertrophy of tissues. 3. Operation too soon after acute inflammation in the joint has subsided means failure. 4. In gonorrhoeal knees with arthroplasty the postoperative care should be gentle. A longer time is required for good results.

Arthrodesis for Nontuberculous Hip Joint.—H. W. Spiers (*Journal of Orthopedic Surgery*, September, 1920) presents the following conclusions from a study of thirty-four operative cases from the orthopedic clinic of the Massachusetts General Hospital: 1. Arthrodesis for painful hips of traumatic origin gives a satisfactory end result. 2. Arthrodesis for painful hips of hypertrophic arthritic origin are less satisfactory but justified. 3. The time of convalescence is a long one, approaching a year. 4. The tendency of the extremity is to return to the position of adduction and little should be promised in this regard.

Blood Changes Following Röntgen Ray Treatment of Leucemia.—Charles L. Martin and W. Denis (*American Journal of the Medical Sciences*, August, 1920) report the results obtained in four cases of myelogenous leucemia in which the chemical changes occurring in certain of the nonprotein constituents of the blood during röntgen ray treatment have been followed. In the more severe cases the nonprotein nitrogen was extremely high; after treatment a gradual but steady fall was noted. In view of the fact that the creatinin values are invariably normal and that in the most severe case the urea accounted for only twenty per cent. of the nonprotein nitrogen fraction, instead of the usual fifty per cent., the suggestion is made that in leucemia there is present, possibly as a constituent of the white cells, some nitrogenous constituent not accounted for in the present scheme of blood analysis. The true acid content of the blood was much increased.

Proceedings of National and Local Societies

AMERICAN ASSOCIATION OF OBSTETRICIANS, GYNECOLOGISTS, AND ABDOMINAL SURGEONS.

Thirty-third Annual Meeting, Held at Atlantic City, N. J., September 20, 21, and 22, 1920.

The President, Dr. GEORGE W. CRILE, in the Chair.

(Concluded from page 788.)

Treatment of Abortion Complicated by Sepsis.

—Dr. GEORGE A. PECK, of New Rochelle, drew the following conclusions: 1. The conservative treatment of abortion complicated by sepsis is based on pathological entities and clinical end results. 2. Hemorrhage is the only symptom that may demand a prompt and thorough emptying of the uterus for its control. 3. Every intrauterine manipulation or procedure should be executed with the greatest care to avoid traumatizing and otherwise injuring the endometrium. 4. Late cases, and especially those in which the patients had already been subjected to curettement, are eminently suitable for this form of treatment.

Missed Abortion.—Dr. JENNINGS C. LITZENBERG, of Minneapolis, Minn., stated that missed abortion was the retention of a dead fetus before viability retained in utero more than two months after birth. It was a common condition and was dangerous, as temporary ill health until the uterus was emptied, or permanent ill health would result. The diagnosis was not unusually difficult. The uterus should be emptied before the condition became a menace to health and life.

Preparation of the Skin for Operation with Special Reference to the Use of Picric Acid.—Dr. H. W. HEWITT, of Detroit, Mich., stated that it seemed clear that a good preparation for disinfection of the skin should possess the following properties, namely: 1. It should be simple and easy of application. 2. It should be efficient, *i.e.*, have the power of destroying the common skin organisms in a comparatively short time (not over three minutes), and be sufficiently powerful to keep the skin sterile during the operation. 3. It should not macerate or injure the skin in any way. 4. In laparotomies it should not injure the peritoneal coat of the intestine, if the intestine accidentally came in contact with it. 5. It should be of universal application. 6. It should contain no proprietary preparations, since these were of unknown strength and could not be depended upon. 7. It should be standardized, so that its antiseptic value might be known. Solutions might be standardized by the Walker-Rideal method. Of all the methods and chemicals in use today, very few approached this standard. Bichloride of mercury in aqueous solution would not sterilize the skin; in Harrington's solution it was efficient, but this solution contained hydrochloric acid and injured the skin. Dr. Hewitt said that he had used this solution extensively, but had discarded it.

About three years ago his attention was attracted to picric acid as used in the British Army. Chemically,

ally, picric acid was known as trinitrophenol, its formula was $C_6H_2(NO_2)_3OH$, and it was soluble in ninety-five parts of water and sixteen parts of alcohol. It had been used to a large extent in the treatment of burns and was known as a parasiticide. It was also astringent and penetrated deeply the corneous layer of the skin. Its only disadvantage had been in staining the skin, an effect which would last from twelve to eighteen days but might be removed by the application of a five per cent. solution of carbonate of soda, or a twenty-five per cent. solution of ammonia in ethyl alcohol, provided this was done immediately after the operation was finished. The picric acid solution used in these experiments and in his clinic was made by saturating a seventy per cent. ethyl alcohol solution with picric acid, which made a six per cent. solution.

The merits of this method of preparation were many, namely, it was simple; it was cheap; it was efficient; it did not injure the skin in any way, and might be used on any part of the body; it did not injure the peritoneal coat of the intestine; it contained no proprietary preparation, and its antiseptic strength might be standardized. This was only a preliminary report. The staff of Grace Hospital, Detroit, had used this preparation, up to August 1, 1920, in 926 cases, and it was now the adopted method of skin preparation in that hospital. The number of cases reported was still too small to justify definite conclusions, but Dr. Hewitt said he hoped at some future time to report a series sufficiently large to be of clinical value.

Pathology of Common Puerperal Lesions.

Dr. JOHN OSBORN POLAK, of Brooklyn, N. Y., stated that in order thoroughly to grasp the physiological pathology which actually took place, one must appreciate that the uterus, during involution, was a puerperal wound. Its interior was undergoing the normal process of repair and inoculation of this wound would produce either a toxemia or a definite inflammatory reaction, depending largely on the character of the infecting organism. At first, this wound infection was a local process which might be illustrated in the infected perineum, or the infected cervix tear, or the infected endometrium. In each, there was an inflammatory reaction in the adjacent tissues, which limited extension of the infective process and confined it to a circumscribed area about the wound or within the uterus. In these localized lesions the pyrexia and other constitutional symptoms were due to two factors. The toxemia resulting from an absorption of the toxins liberated by the bacteria and second, to the tissue reaction excited. On the other hand, the process might be a spreading infection extending beyond the wound area. This was due either to the increased virulence of the infecting bacterium or to the diminished resistance of the tissues. This spreading infection might occur by extension through the lymphatics within the walls of the uterus, spreading to the lymphatics in the para-

metrium producing a parametritis, or a peritonitis, or even a bacteriemia, or the infection might extend through the blood vessels, in which case it manifested itself clinically as a thrombophlebitis, an embolic pyemia, or a bacteriemia.

Clinical experience had shown him that a well contracted uterus in normal anteversion was capable of emptying itself of its contents if infection was not introduced from the outside. Experience had taught him that any sort of trauma to the delicate granulation wall of the puerperal uterus which was confining the infection within the cavity, opened avenues of extension, and that lateral parametritis was a constant sequel of attempts at digital or instrumental evacuation. It was important to note that the encapsulated germs did not always lose their virulence, but might on the occasion of subsequent traumatism or operation break out with increased virulence and cause a bacteriemia.

In blood stream infections the local pathological reaction was considerable, consequently the local symptomatology was insignificant; for whether the bacteria entered the blood stream via the lymphatics, or via the veins, their transit was so rapid and the reaction caused so insignificant, that appreciable local lesions must necessarily be absent. For the entrance of bacteria into the blood stream, there must be a puerperal wound which was inoculated by bacteria. Broadly speaking, the treatment depended on the pathological diagnosis and might be considered under the following heads: 1. Local measures which secured drainage and uterine contraction. 2. General supportive measures that increased the patient's resistance. 3. Specific remedies, especially of value in blood stream infections. 4. Finally, surgical measures. These were only applicable to abscess formations and thrombotic lesions of the pelvic veins.

Factors That Determine Tissue Resistance to Cancer.—Dr. JAMES E. DAVIS, of Detroit, Mich., said that the life of a complex organism was the result of cell interactions and the internal metabolism of the individual cells. Factors altering cell interactions were tolerated by the high vertebrate forms only when it was possible to accomplish conformation within a limited period of time. Convincing examples of this fact were observed after amputations, resections, traumatizations, autotransplants and homotransplants and heteroplastic grafts. Loeb transplanted thyroid into subcutaneous tissue, removed it seven days later, and found the transplant surrounded by a connective tissue capsule rich in fibroblasts. Inside the capsule a large vessel was proliferating. In the capsule and about the vessel a few thyroid acini in contracted form were persisting. Necrosis, hemorrhage and organization were going on elsewhere conforming the transplant.

The transplantation of tumors in the higher species of animals had failed, excepting the infectious sarcoma of the dog. In the normal tissues resistance was adequate for control and destruction of inherent neoplastic dynamic growth power which was uncontrollable in its autogenetically prepared tissue. The cell and its surrounding fluid possessed interactive and retroactive properties. The most convincing proof of this was given by

Carrel who had grown connective tissue *in vitro* for almost eight years. The plasmatic jelly medium when used too long became liquefied, its fibrin disappeared and the air rarefied, effecting a marked slowing of growth. Fresh, unused plasma from the icebox promptly quickened the growth rate. The plasma from a chicken four to five months old caused a growth fifteen microns more extensive than did that from a five to six year old chicken.

The reactions following exhaustion, irritation and specific diet, gave acidity, toxicity, and cytoplasmic sensitization. Measurement of these states was a procedure of real scientific value to the clinician. The reaction of connective tissue to epithelial neoplasia before and after its invasion was significant and important. Epithelial cell disintegration stimulated phagocytic and proliferative connective tissue reaction and the latter in turn might possibly cause increase of dynamic growth power, without a corresponding increase of nutrition. The clinical recognition of long continued cell irritation and unbalance of tissue was too frequently delayed until after the expression of organic functional disorder. The determination of stressed or irritated tissue potentiality should have much attention. The determination of sensitization acidity and oxidation reactions were essentially quantitative tests which had relational value in this problem. It was mainly a quantitative difference in energy and time factors that existed between regenerating and cancerous cells and it was for this difference one should test. Physiological growth, regeneration and neoplasia utilized the same means to produce a product and resistance was an essential cause for all three. Normal growth was production under control, regeneration was production to control, and neoplasia was production without control.

BRITISH NATIONAL ASSOCIATION
FOR THE PREVENTION OF
TUBERCULOSIS.

*Annual Conference Held in Liverpool, England.
October 7, 8, and 9, 1920.*

The President, SIR ARTHUR STANLEY, in the Chair.

Prevention and Treatment of Tuberculosis.—A paper on this subject by Dr. E. W. HOPE, officer of health of Liverpool, was read by Dr. Musson, deputy medical officer. It presented a review of the various methods of prevention and treatment of tuberculosis, advocated from time to time, the extent to which they have been followed, and the results obtained. Dr. Hope pointed out that treatment had hitherto received an overwhelmingly greater amount of attention than prevention. In the case of the other great scourges of the human race in bygone days, plague, leprosy, smallpox, typhus, and malaria, the same phenomenon was observed, but prevention had come into its own at last. He thought that there was no doubt that the sanatorium had been introduced with an unfortunate flourish of trumpets, which resulted in inflated expectations among those who did not appreciate the precise functions of such institutions. Sanatoriums were necessary, but the benefits that they conferred

would be more effective and more lasting the earlier the patient could be brought under their good influences. The value of educational methods in the prevention of tuberculosis could hardly be exaggerated. The sanatorium, the tuberculosis dispensary, and the medical practitioner, all had their part.

Tuberculosis—a Social Problem.—Lieutenant Colonel NATHAN RAW, M. D., M. P., said that of all the diseases with which authorities were called upon to deal none was more difficult, perplexing, and unsatisfactory than tuberculosis. It was difficult because, unlike any other disease, tuberculosis was part and parcel of the social problem of the country. It thrived and was spread in insanitary housing conditions and in turn tuberculosis caused poverty and distress with unemployment and destitution. The problem was perplexing, because we had not yet an accurate knowledge of the disease. It was known that tuberculosis was caused by a germ, the tubercle bacillus, and was therefore an infectious disease, but they were not by any means certain as to how or when infection took place in the human body. It was known that tuberculosis was never hereditary, and that it was therefore a preventable disease, and, given proper and adequate treatment, it was curable. The results of treatment were at the present time unsatisfactory, due almost entirely to the fact that sufficient time could not be devoted by the patient to his cure. In his opinion, nothing less than six months' treatment under open air conditions was of much service, and many patients required one or two years. The provision of village settlements in which suitable men might permanently reside, earn their own living, and have their relatives live near them, was the most satisfactory method of treatment, but, of course, it was the most costly. He felt sure that the removal of tuberculosis, more especially in regard to treatment, from the provisions of the National Insurance Act, and its constitution as a special branch of the Ministry of Health, the responsibility for dealing with it being given to the local authorities with a substantial grant from Imperial funds toward the cost of treatment, would result in enormous improvement.

Sanatorium Treatment of Tuberculosis.—Dr. IAN STEWART STROTHERS, of Aberdeenshire, said that in his opinion people were not justified in being content with the results obtained from sanatorium treatment, and this belief was shared by others who had to deal with individual patients. He thought that there was a growing sense of dissatisfaction among the laity with the small number of cures turned out by sanatoriums. Nevertheless, experience showed that these institutions remained the best means at their disposal. What was most urgently needed was a national scheme of widely organized research directed toward the treatment of pulmonary tuberculosis. He suggested that every sanatorium should be a centre where students and graduates could have a few weeks of instruction to increase their knowledge of tuberculosis. Two factors militated against good results from sanatoriums, a, the large number of patients allocated to one medical officer, and, b, the late stage of the disease when patients arrived.

A Specific for Tuberculosis.—Dr. PAUL LEWIS, of the Henry Phipps Institute, gave a brief account of the experimental work in tuberculosis that was being carried on there, and said he felt confident that systematic trial would result in the finding of a specific chemical substance that would be as beneficial in tuberculosis as salvarsan was in syphilis.

Crowding in Tuberculosis Clinics.—Dr. H. HYSLOP THOMSON, county medical officer of Hertfordshire, County Council, referred to the undesirable crowding that existed in certain tuberculosis clinics, and of the necessity for coordinating home and dispensary treatment. Such coordination was most necessary in scattered rural districts. He suggested the appointment of medical practitioners as part time tuberculosis officers to work in cooperation with whole time officers whose duty would include attendance at the clinic at each session with the tuberculosis officer and the attending of domiciliary cases at their homes.

The Human Element in Tuberculosis Work.—Sir HENRY GAUVAIN, medical superintendent of Lord Mayor Ireloar Cripples' Hospital, said that money might be lavished on a scheme for tuberculosis control, but unless the human element was at work the money would be wasted or yield a poor return. The British Government had realized that important grants of money must be made, and was not only doing much, but was prepared to do much more. The Ministry of Health had recognized its responsibilities, was making increased provision for treatment, establishing more beds, founding colonies for the tuberculous, and straining every nerve by exhortation and grants of money to meet the needs of the unfortunate sufferers from tuberculous disease. But was it doing enough; was it getting or going to get the best value for the money and effort expended? If not, how could it do better? Were its energies being utilized in the best direction? If not, could they suggest better or more perfect methods? These were questions which those seriously engaged in solving tuberculosis problems must endeavor to answer. They were fighting an enemy more difficult to subdue than any human foe. They were spending vast sums of money; they were going to spend more, but they lacked a clearly defined policy. The remedy was reasonably clear. Intensive and well planned efforts to educate the public to the danger confronting it should be made. These were preventive and defensive measures, but the surest means of defense was offense. It was here, perhaps, that they could do much more. The neglect of adequate instruction in the prevention, diagnosis and treatment of tuberculous disease in the medical schools was serious. A few teachers did take some interest in the treatment of tuberculosis, but they appeared to be the exception and not the rule. Much more time should be devoted in medical schools to really intelligent instruction in tuberculous disease. It was imperative, if real and speedy progress was to be made, that thorough and systematic instruction in all forms of tuberculous disease should be given in the medical schools and facilities given for extramural knowledge to be obtained. In all the British Empire only one university had established a pro-

fessorship in tuberculosis. That was at Edinburgh, where the chair was held by the distinguished vice-president of the association council, Sir Robert Philip. As far as he was aware, in only one special hospital for nonpulmonary consumption was regular and systematic instruction given, and that was at Alton, where the wards were thrown open to medical men and students by the generosity of Sir William Ireloar and his cotrustees, and even meals were supplied to students attending the courses, all without a fee of any kind. He held strongly that their first line of offense against tuberculosis was held by the general medical practitioner. Too little had been done to enlist his powerful help.

When they came to the tuberculosis service an even worse state of affairs obtained. He realized that he was treading now on dangerous ground. He had the greatest admiration for those devoted men engaged on this thankless and comparatively unremunerative task. Only those who had had an opportunity of seeing their work closely, understanding the difficulties of their position, and the depressing nature of their duties, could realize the disadvantages under which they labored. Happily, a large proportion were men of vast experience in tuberculosis, experience acquired after many years of close study, but that was due to a combination of circumstances for which the public was to be congratulated and was not the result of generous or even good management. Only enthusiasm and a high sense of duty could sustain them in a thoroughly disheartening task. There was much discontent in the service, and the members of it would be more than human if there was not. That state of affairs should be remedied.

How could the necessary reform be effected? It might not apparently be so urgent now. But what about the time when these highly skilled and experienced men were no longer able to continue? It might be urged that they would be replaced; but by whom? It was not generally known and it should be known that not one single regulation had been framed governing the admission of recruits to the tuberculosis service. A man might have had no experience whatever in such work, might be unsuited by temperament or by training, but so long as he was a qualified medical man, he was eligible for appointment as tuberculosis officer. And when appointed it must be remembered that he was given no facilities whatever for becoming a real expert at the work. He was thrown straight into an appointment, and had to acquire knowledge of the work as best he could in a limited field. He had urged the establishment of a diploma in tuberculosis which would prove the holder's competence in the duties he had to undertake. If the Government was going to launch a great campaign against tuberculosis, half measures would not do; efficient work was essential and was obtainable. The tuberculosis service must be regarded seriously; the human factor required to achieve success must be fostered, encouraged, and given power to achieve substantial results. The tuberculosis service must be an attractive service, offering scope and substantial reward to those entering, and facilities for research and progress.

(To be concluded.)

Letters to the Editors.

THE MEDICAL PROFESSION AND THE HALL OF FAME.

NEW YORK, November 10, 1920.

To the Editor:

A few months ago I sent out a plea for recognition of the medical profession in the Hall of Fame and especially for Morton as perhaps the most outstanding figure in American medicine. This was published in many of our leading medical periodicals, and as yours was one which extended the hospitality of its columns to the cause, I am sure you have in no small degree helped in the election of Morton's name. The outcome of the recent election must be gratifying to every American physician who is familiar with Morton's life, his struggles for recognition, and the sad experience he was made to undergo by those who attacked him during life and those who up to this time wished to withhold from him the credit for his work.

Our never to be forgotten Osler, with his keen sense of justice, gave us the result of his profound study of historical medicine concerning Morton's share in the discovery and promulgation of ether anesthesia in the following words: "William T. G. Morton was a new Prometheus who gave a gift to the world as rich as that of fire, the greatest single gift ever made to suffering humanity." And Professor Welch confirms the investigation of his lifelong friend and in one of his recent letters to me says: "Surgical anesthesia has been America's greatest contribution to medicine and surgery and it would be a thousand pities not to have this recognized in the Hall of Fame. As only one name can be selected for this purpose, it is clear to me that this name should be Morton." Professor Welch was one of the electors and his influence was undoubtedly an important factor in Morton's final triumph.

It will doubtlessly interest the readers of the NEW YORK MEDICAL JOURNAL to know the exact outcome of this year's election of America's immortals for the Hall of Fame. Of the 178 names voted on the following seven were chosen: Samuel Langhorne Clemens (Mark Twain), who received seventy-two votes; James Buchanan Eads, the engineer, fifty-one; Patrick Henry, statesman, fifty-seven; William Thomas Green Morton, discoverer of ether, seventy-two; Augustus Saint-Gaudens, the sculptor, sixty-seven, and Roger Williams, the minister, a leader in liberal religion and founder of Providence, R. I., sixty-six. The only woman who received enough votes to place her name on the roll was Alice Freeman Palmer, the educator, who received fifty-three votes.

That Morton, together with our most beloved Mark Twain, should have received more votes than any other candidate, is a particularly good omen for the medical profession, and it is to be hoped that in future elections the names of our other great pathfinders in medicine and surgery may not be forgotten. Such names as Ephraim McDowell, J. Marion Sims, Benjamin Rush, Walter Reed, all deserve a place among the immortals in America's Hall of Fame. S. ADOLPHUS KNOPF, M. D.

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Original Communications

THE THEORY OF THE PNEUMA IN ARISTOTLE.

BY JONATHAN WRIGHT, M. D.,
Pleasantville, N. Y.

The revolt of Hippocrates against the Nature philosophers is set forth in the opening paragraphs of the essay on *The Ancient Medicine*. They had indeed failed to solve the mystery of life and they had also failed to correct the erroneous and folly laden assumption as to the pneuma and the air, but in order to secure the resumption of that progress which the Nature philosophy had initiated and of which Hippocrates was the heir, this was a necessity. That was to begin, however, only after the passing of Hippocrates and Plato and Aristotle. Galen credits them, apparently only on evidence accessible to us still, with very much more knowledge of anatomy than is apparent to us in their writings. He says (1a) they did not write of what, by virtue of their manner of medical training, they had acquired in home instruction as boys, apprenticed to a preceptor who was often a father, but this is hardly convincing to the modern reader who easily perceives the cause of error into which before the time of the Alexandrians, the Greeks fell in the explanation of morbid phenomena they encountered in practice.

It would seem as though, if the pneuma entered the hollow channels of the body and was seen to pulsate in the heart and in the peripheral blood vessels, from which blood spurted when cut, that blood must accompany the pneuma. Indeed this is still further remarkable from a historical point of view. "Blood is the life" was a dogma accepted by primitive man and by civilization immeasurably older than Greek culture. It apparently had been modified by some of the orientals and had been thought of rather as the vehicle of life or of the pneuma, but it was apparently in Egypt that the vessels were first thought of as carrying it exclusively. One fails to be at all assured of any provision made for a distinction between those which did and those which did not carry blood. Until, therefore, there came a time when the purely objective differentiation of artery from vein began to be made, it was quite impossible for any theory to arise which separated the blood from the air. The separation of purely blood channels from gastrointestinal, from air channels and from other ducts and conduits of the body was probably never entirely complete in the anatomy of

the Egyptians (2). The confusion of the trachea and the other air channels with blood channels appears in the earliest of the Greek records and this lack of differentiation of the veins from the arteries was the origin of that school of pneumatists who declared the arteries contained both blood and air, when that differentiation was once made, but apparently by the time of Galen the majority believed the arteries carried air alone and the veins blood alone. I shall have occasion to discuss the doctrine as to this point, which obtained in the time of Hippocrates, but the state of belief may be inferred from the fact that Aristotle, who lived after him by a generation at least, knew, apparently, all that had been done by his predecessors, and yet made no mention of the differentiation, but himself advanced it so far only as to name the trachea the *aspera arteria*, instead of calling it simply *arteria* and giving the modern name to the aorta (3a), and saying some blood vessels have thicker coats than others.

Man had begun to reason that if, as was quite apparent, the pneuma was the regulator and director of all things in the body and directly continuous with the world soul outside of it, then all the emotions and intelligence of man must dwell in his heart, whence it could regulate all peripheral manifestations. I am not going to detail the urgent reasons he found in facts known to him and in the beliefs of the more ancient nature philosophers, but Aristotle believed this. He sought support in the facts. The greatest mind, not only of philosophy, for Plato also believed it with reservations and explanations, but Aristotle, the greatest observer perhaps of all time, believed it, just as Homer and Hesiod, the greatest of poets, believed it. We may laugh at Diogenes Apollonius, since we know little else about him except that Aristotle quotes (3a) his description of the veins, but no one laughs at Plato and Aristotle who has read a page of them, or at Homer, either, who has read a line of him. The intellect, as well as the emotions, was located in the heart, because the soul pneuma went there, and thither went the air when it was identified as the material part of the pneuma.

The belief in this basis fixed in the minds of men, the beating of the heart from fear or exultation, elated by love and distressed by sorrow, we can easily understand, was a suggestion of proof, if any were needed, which was weighty enough though it may seem to us trivial. The eructations of a

disordered stomach, accompanied by cardiac sensations, are a familiar phenomenon easily attributable to disturbance of the pneuma. The latter passes, it is true, into the mouth and down the windpipe to the root of the lungs, but there a complexity of structures was found that defied exact definition. If the pneuma was the regulator of life, if the brain was not yet known as the centre of thought, emotion and of sensation and the organ from which voluntary motion received its orders, then the pneuma which presides over all these must pass to the uttermost regions of the body and, in default of the nerves also unknown, must regulate matters on the spot or have its seat in the blood which reaches all parts. In the sensory centres is the heart which is the reservoir of the blood. Thus all concepts of anatomy and physiology hung upon the central belief in some material thing which traversed the conduits of the body with the blood or through certain of them which we now know carry arterial blood and which, at the root of the lungs or in their substance, was in continuity or in direct connection with what we now know as the air passages.

I have purposely referred to the pneuma as a material thing, despite the fact that philosophers identified it with the soul within the body and with the world soul or universal pneuma without the body. Those of us who think of the soul no longer connect it with material things. We no longer thus think of fear, joy, hate; they no longer have for us a local habitation as well as a name. All these concepts, however, for the ancients were realities. Galen, paraphrasing the way of Plato in the *Timæus* describes (1b) the Creator, or Nature, making the substance of the humors out of the dry and the wet. Out of the cold and the hot he constructed the pneuma, and this he used as an instrument to mold the humors into the shape of the organs of the body. Of course it is not difficult to find many passages in which we miss this materialistic acceptance of abstract ideas, but it nevertheless will be found to lie at the bottom of what, unless we realize its existence, would otherwise be quite inexplicable in the thought of ancient philosophers from Plato down.

Plutarch said the Stoics make the qualities which we designate as descriptive adjectives or attributes to nominal or actual objects, "bodies also." They must have their seat somewhere in the body, chiefly as parts incorporated with the pneuma or soul. We may call this mysticism, but it has a material connotation which we must not allow to escape us in the study of ancient anatomical thought. It is not sufficient for us to know that practically all medicine was originally written in the temples but we must see clearly the origin of the ideas which entered into the history of medicine after it left the temples. For more than a thousand years they bore the stamp of their birthmark.

Aristotle did not escape their influence. He had noted indeed the difference in the thickness of the tunics of the blood vessels. Herophilus after him said (1c) the pulmonary artery had walls six times as thick as the pulmonary vein. But the pneuma was still such a real thing to Aristotle,

though evidently the concept of the soul was a little separated in this thought from the pneuma, that he explains the voice (3f), in contradistinction to the other noises of respiration in the larynx, as the force of the soul striking on the respired air. We gain the impression from this that it is not the command of the brain sending a message through the laryngeal nerves for the larynx to produce a sound indicating what is going on in the brain. That, I take it, is the modern view in the simplest words. In the ancient view it is the pneuma on the spot which orders things so that the thought, in which it participates and which it connects with the outside world, finds expression. I may attempt to render it more plain by another illustration. Today, as of old, a cut made at the surface of the skin seems instantaneously apprehended by consciousness. We can now measure the time, it is true, but it seems still that we instantly jerk away the injured finger. We understand it as a fact now, but if we had had to explain it to an ancient Greek, that the sensation must travel up one nerve to the brain, or spinal cord, and then have its message translated and orders issued and sent down another nerve for the withdrawal of the finger, the Greek would have thought it one of Aristophanes's jokes. For him the pneuma was on the spot, in communication through the blood channels with the heart, it is true, but ready to act in an emergency on its own initiative reflex action, without waiting for orders from headquarters in the heart. This is the conception Galen in his turn, having discovered the laryngeal nerve, set himself to dispel. It took a thousand years and more.

Aristotle was not ready to go as far as the half mythical Orpheus, Simplicius says, and "call the aptitude of bodies to life respiration," but to the modern reader his attitude does not seem far removed from this pantheism of primitive man. In his *History of Animals* (3b) Aristotle refers to the heart, "or a part analogous to the heart," as the principle of motion and the principle of the senses and, therefore, of the whole animal; the brain only tempers the heat of the heart. Others, Plato and the authors of some of the spurious Hippocratic books, some supposed to be earlier, some certainly later than Hippocrates, also thought it was the pulmonary air that cooled the heart. In his treatise on the respiration (3g) Aristotle agrees with them that the function of respiration is the regulation of the heat and the moisture, because of the porous nature of the lungs and because the air is so attenuated. In his tract on *Sleep and Wakefulness* (3h) he says the intelligence is shut off from the head by the ligature of the jugular veins, but evidently, from what precedes, this is due to the pneuma of the blood having its communication with the heart interrupted, and not due to the blood stasis in the brain.

The soul of man includes the principle of sense and motion. As it has become clear that Plato (5), like the African and American philosophers of primitive man, was driven to the expedient of multiple souls or the manifold function of the soul, so Aristotle carries a full cargo of functions for it and evidently sails the seas, as they did, on a pneuma

ship. He adjusts his anatomy of the heart and blood vessels better than did Polybus and Syennesis and Diogenes Apollonius, whom he quotes; but the trachea remains the *aspera arteria*, with no indication, but a note on the variations in their calibre and wall thickness, that blood vessels are divisible into veins and arteries.

Aristotle is thought to have attended Plato's teachings in the Academy for some years succeeding 367 B. C., founding the lyceum at Athens perhaps thirty years later. The son of a distinguished physician, the Æsclepiad Nichomachus, and himself apparently versed in all the theoretical medical learning of the day, he knew much more of the internal anatomical structure of animals than of man. Galen said, despite his great knowledge, he knew little of dissection. We must keep this in mind in thinking out a consistent explanation for the persistence of the fundamental theory of life phenomena represented by the pantheistic conception of the *pneuma*. I have emphasized elsewhere (5) its intimate association with the very fibre of the thought of primitive man, but it could only persist as an interpretation of human anatomy in the absence of an intimate acquaintance with practical experience in the dissection of the human body. It is true we must accept this explanation with all its limiting modifications. There are abundant examples of the existence of a knowledge of the most elementary facts which are entirely inconsistent with long prevailing theory. The facts often fade from men's consciousness before they have destroyed the false belief and have to be discovered again. We may find one exemplification of this in Galen's attitude toward the *pneuma*. He was blinded by the prevailing belief, doubtless, to such an extent that he missed the evidence open to his sight in the dissection of animals, but nevertheless he was by virtue of that experience only a faint hearted believer and pointed out, not enough evidently to dispel all his prepossessions, but ample to allow us to perceive that had he had sufficient moral support he would have preceded Harvey in a proper understanding of the circulation. As it was Galen faltered and his mental process seems to have been: If there is such a thing as the *pneuma* then we must accept the following as the physiological fact; whereupon he proceeds (1d) with a scheme that was as preposterous then for him as it would be for the most experienced naked eye observer today. Galen, however, had a very mediocre, if very vigorous, mind. We may conjecture that the results would have been different if Galen's facts had been food for the intellect of a Plato or an Aristotle. But despite all the philosophy and notwithstanding the profound skepticism of the minds of these Greeks, in their day they were slaves, if not to the feelings of horror of the contact of the dead human body entertained by the common people, at least they were subservient to the laws and the public sentiment arising out of that primitive terror which to some extent is still with us. That real dissection of the human body should apparently have begun at Alexandria, on the continent of Africa, the birthplace and the domicile of religious faith and fanaticism, is explicable only on the reflection that the

Greek rulers were enlightened men, free from the dangers the superstitions of the masses create for those innovators living under more democratic forms of government. Every rose has its thorn, as we modern democrats often have occasion to reflect.

But we should not be blinded by the absence of freedom of thought which finds courage under the ægis of autocracy to fly in the face of popular prejudice. There was something more than the shudder at the sight of death, something more deeply grounded than the religious and legal formula based on it. Both Aristotle and Hippocrates were alike ignorant as to the number and arrangement of the sutures of the human skull, which in those days must often enough have offered itself for observation. It is plain that Hippocrates must have examined skulls, as in self criticism for a mistake in diagnosis he reveals an acquaintance with sutures, but he gives no coherent account of them, while Aristotle seems to have examined them in the most superficial fashion. There seems indeed to have existed an unconquerable repugnance even to look at the dead human body, which we can easily understand, but singular to say this coexisted with an indifference to what a careful study of its anatomy might have taught them which amounted to apathy and which it is more difficult to understand. Instead, therefore, of wondering at the errors of Aristotle's physiology of the circulation and the respiration we should realize his deep ignorance of anything in the hidden anatomy of man which differed from that of animals. This he manifestly was well acquainted with, yet even in animals he missed the obvious features in the thoracic viscera which should have given him a clear insight into the erroneous details of his theory of the *pneuma*. Fundamentally it rested on the truth which we still recognize in the chemical term, oxygenation. That we know lies at the basis of all animal life manifestations and the *pneuma* we may look upon as that indispensable and chief element in the air which must go everywhere in the body to maintain life.

Yet for Aristotle the chief function of respiration was to supply air and water to the heart for the regulation of the animal heat which had its chief seat there, the brain sharing the function of moistening the heart. We may find a sufficient explanation for the ignorance of anatomy in the few generations which cover the life spans of Hippocrates, Plato and Aristotle, if not for their apathy in the matter, but that Aristotle, with all his biological knowledge of bird and beast, including an unrivalled knowledge of their anatomy, with the advantages of the parental training and those of Plato himself, that a mind such as his thus equipped should on the whole have had less accurate ideas of human physiology than Plato's seems to me singular. It would seem that so long as a scientific man does not use his facts in a critical analysis of his theories, so long as he does not practise those rules of deductive reasoning which Aristotle himself formulated, so long as he does not combine induction and deduction in his every day thought, he is sure to go wide of the path of the truth.

Correct as the fundamental idea of the primitive

pneumatist was, it led astray one of the greatest minds of antiquity not only as to the physiology but as to the anatomy itself of man. Unaccustomed, as we must suppose Plato was, to study at first hand the facts of nature, untaught in the knowledge his eminent pupil brought into the world, he was still able to construct a less erroneous view of physiological processes than Aristotle. He arrived at a basis more in accord, crude as it was, with the principles which underlie the teachings of modern histology, than did the great naturalist. If I have read Plato aright he appreciated the necessity for the existence of the capillary circulation, if not for the lymphatics and his deductive reasoning supplied what Aristotle's facts failed to reveal. In his *History of Animals* (3) Aristotle declares: "When the trachea is filled with air, it distributes breath (pneuma) to the cavities of the lungs . . . it only inhales and exhales breath and nothing else either dry or moist." There is no germ here or elsewhere of a capillary circulation, no hint of the life giving oxygen, the real food of life, indeed he denies the idea of it. In his essay on *Respiration* he says: "It must not be considered that respiration is produced for the sake of nutriment, as if the inward fire were nourished by spirit, just as fire is nourished by combustible matter and the vital heat being nourished the relics of the nutriment are emitted by expiration." As a matter of fact this is in general outline just what occurs. His denial of it was in opposition to the views of others who had arrived thus far on the right path without the encyclopedic knowledge of the Stagyrte. He could repeat (3d) with apparent credulity the mythical view of an Australian savage, that impregnation with the pneuma is possible, telling of a hen partridge fecundated by a breath blowing on her from the male—but the biochemical significance of the pneuma when it is taken in by respiration he missed; not only that, he rejected any suggestion pointing in that direction. He criticized the passage in the *Timæus* on which in the last essay I dwell at some length, because it makes the inspired air take part in the process of digestion also and it is not confined to his idea of cooling and moistening the pneuma in the heart.

As soon as we reach Plato and Aristotle we find the soul quite a complicated affair. This is very likely because we have so much more of their work than that of other philosophers left to us. From others there remain to us only isolated sentences or phrases from which we are to infer their views, isolated and quoted by Aristotle himself or by Theophrastus, his successor or by others much later, but in all probability the views of others, as completely developed as those of Plato and Aristotle, would show a like confusion and, of course, a greater variety. To Aristotle, in his treatise on *The Soul* we owe what we have of the views of Thales and Democritus, of Hippo and Heraclitus, of Empedocles and of many others. To the extent with which he notices these is due our somewhat uncertain idea as to just what he believed himself. We get enough out of it all, however, to see that he entertained essentially the ideas of the Egyptians, as set forth in the papyri we now have. The soul, if not identified fully with the air of the breath, had its seat with it

chiefly in the blood. In referring to the heart or a part "analogous to the heart" as the principle of motion and the site where the apperceptions of the senses are interpreted, he is in opposition to Alcmaeon and Plato. That was the seat of the intellect, which Plato, doubtless influenced by the traditions of Alcmaeon's teachings in the Sicilian School, placed in the head, in his tripartite division of the soul of man. For Aristotle the regulation of the heat and the moisture of the system was the manifestation of the pneuma or the soul mingled with the blood near the heart, as we have seen in his treatise on the respiration, but in his *History of Animals* we read (3c): "Passages lead from the lungs to the heart and they are divided in the same way as the trachea throughout the whole lungs and the passages leading from the heart are at the upper part. There is no passage which is common to them both, but by their union they receive the breath and transmit it through the heart, for one of the passages leads to the right cavity and the other to the left." The contradiction and the obscurity here we have every reason to believe were due to the necessity that pressed upon him to get the pneuma out of one set of vessels and into the other. The union of them he had never seen and his conception of it is not suggestive of anything but his embarrassment when confronted by the theory and his inability to find support for it in fact. His imagination did not serve him as well as Plato's did him.

Aristotle is credited with having named the aorta. He seems to have used the word previously applied by some of the Hippocratic writers to the lower part of the air passages. Some have ascribed to Hippocrates the first differentiation of artery from vein, but his allusion to the fact that some veins have thicker walls than others is the only intimation that I find of it, while Galen ascribes the differentiation more specifically to Praxagoras, the instructor of Herophilus, but he makes the assertion without citation. The ascription of sensory phenomena to the heart does not seem to have been worked out very satisfactorily, but sensation for Aristotle, as Beare (6) thinks, seems to have been carried in the same vessels with the blood associated with the pneuma, just as we have seen the soul or the pneuma producing the voice in the larynx. It seems to me quite clear that the whole scheme in Aristotle's mind was blurred by his clinging to the pantheistic basis of primitive man's conception of the soul as responsible for all the details of bodily movement and sensation after his own observations had necessitated its modification.

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STANDARDIZED ROENTGEN RAY IN THE TREATMENT OF SKIN DISEASES.

With Special Reference to Eczema.

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One of the greatest advances in dermatological therapeutics has been the standardization of the röntgen ray. Previous to the introduction of the Coolidge tube all routine röntgen ray treatment was attended with danger even in the hands of an expert. It was necessary for each operator to evolve his own technic, which varied according to the apparatus used. Only by radiometric measurement was it possible to compute the amount of ray given in any particular case. At the present time it is as easy to give a precisely measured amount of röntgen ray as it is to prescribe a measured amount of strychnine. To obtain this desirable result it is necessary to use a Coolidge tube and an interrupterless transformer. The dosage can then be measured by pastilles (of platinocyanide of barium) or by arithmetical computation. Measurement by pastilles is not very satisfactory as this method is difficult for some to learn and in any case introduces the element of personal equation. Through the splendid pioneer work of MacKee, Shearer, Remer and Witherbee, it is now possible to dispense entirely with pastilles and depend upon a simple arithmetic formula to standardize a röntgen ray apparatus.

THE QUANTITY OF THE RAY.

The quantity of ray depends on four factors, namely, spark gap (representing voltage) milliamperage, time and tube distance (from anode to skin). Within certain limits these can be changed to suit the convenience of the operator. In most of my work the following figures have been used: six inch spark gap, two milliamperes, three minutes and eight inch distance, for one so-called skin unit. A half unit was obtained in a minute and a half, and a quarter unit in forty-five seconds, the other three factors remaining unchanged. In cases of ringworm where short exposures were preferred the figures were, as follows: six inch spark gap, five milliamperes, a minute and nineteen seconds and six and one half inch distance.

The skin unit corresponds to one H (Holzknecht) unit with pastille lying on the skin (skin distance) or about five H units with pastille at middistance between anode and skin. This dose will epilate the scalp but will not produce an erythema except as MacKee says, "if given at one sitting, on very sensitive parts such as the face of a young girl." In speaking of H units or fractions thereof in the further course of this article, the words, skin distance, will always be understood.

Over three years ago I published some observations on The Coolidge Tube in the Treatment of Nonmalignant Diseases of the Skin. This was based on an experience of eighteen months with a standardized technic, though I had previously used the ray for a dozen years in the old inaccurate and unsatisfactory manner. It is not often that a paper on a therapeutic subject can be quoted three years later without making certain reservations if not repudiating much that was previously written.

In the present instance my feeling on the subject is best expressed by saying that I enthusiastically agree with my former statement as follows: "With the new apparatus and technic, my opinion of röntgen ray therapy has entirely changed and I may add that I have never made a change in therapeutic measures that compares in satisfaction with the change from the old to the new method of using röntgen rays." My subsequent experience has substantiated this opinion and enabled me to enlarge the usefulness of the standardized treatment. I also subscribe thoroughly to another former statement that "I feel certain that the next generation of röntgen ray therapists will all adopt the newer methods of treatment and think it likely that before long the question of having used the safer technic may have a medicolegal bearing in cases of röntgen ray burns."

What has been said will sound like the veriest platitudes to those who use a standardized technic. Unfortunately there are still many dermatologists who either continue to use the old methods in a desultory way or do not use röntgen ray at all. The profession as a whole is certainly ignorant of the possibilities of modern röntgen ray, while our patients (except those who have been treated by this method) are generally astonished to learn that the value of this agent is not confined to fluoroscopic or photographic work. The technic of giving measured doses is not difficult to learn, even for those who have had no previous experience with the ray. For the trained röntgenologist it is child's play.

In regard to filtration it should be said that practically all of my work has been done with unfiltered rays. I can see no advantage in using an aluminum or other filter in the great majority of skin diseases, situated as they are on the surface of the body. In a few cases, where deep subcutaneous lesions are present as in a case of true Hodgkin's disease, I have preferred to use a filter of three millimetres of aluminum. Filtration, of course, is necessary in treating lymphatic glands or carcinoma of the breast, etc., but this is hardly within the province of dermatological therapeutics.

PROTECTION OF THE SKIN.

Protection of the skin which is not desired to be rayed is amply afforded by lead foil of the thickness of one thirty-second of an inch. As a substitute for lead foil I have used rubber cloth one eighth inch in thickness. One advantage of the rubber cloth is that a single piece of it can be used to cover a considerable area of the body. It is also much more durable than the lead foil though less flexible. It supplements the lead foil as a protection, each having its use according to the locality treated. In treating large areas, such as the back, it often seems best to dispense with the protecting foil and give several exposures at different points and rely upon overlapping of the ray as described by Fred Wise. I still find it most convenient to treat my patients in the recumbent position on a wooden table. A metal table was early discarded after the tube had been punctured by accidental contact with the metallic portion of the tube stand.

An erythema should always be avoided except when treating malignant conditions where two H

units or even larger doses are given. It is only when an erythema is produced that there is any likelihood of future telangiectases. In nearly five years' experience with the new technic I have only produced an erythema (unintentionally) in one case (generalized psoriasis) in which I foolishly tried to accommodate the patient by expediting the treatment.

Pigmentation of the skin was noted in a small proportion of cases, even though the dreaded erythema had been avoided. Fortunately the pigmentation was never permanent, though at times it persisted for months. The tendency of the skin to become pigmented is most marked in brunettes and especially in negroes. One of my patients, from the Harlem Hospital, a young negro boy, was treated for chronic exfoliation of the lips. A few days after a single dose of only one quarter H unit there was a marked pigmentation of the adjacent portion of the lips which had not been covered by lead foil.

To safeguard the patient and to obtain the most accurate results the operator should remain at his post during the entire seance. Standing behind the leaded screen and looking through the lead glass window he should see that the patient does not move and that the milliamperage remains as constant as possible. He should also watch the anode, when it becomes white hot from a large quantity of ray and be ready instantly to throw off the current in the very unusual event of softening of the metal support of the anode and possibly burning the patient. It is best to use one hand for the milliamperage control and the other for the switch which discontinues the current. The practice of operating two or three machines simultaneously by one individual is, I think, improper. A clock may be used to shut off the current automatically at the desired time, but this should not relieve the operator of the responsibility of closely watching the patient and the apparatus.

TREATMENT OF ECZEMA.

Among the various diseases of the skin that were treated, eczema perhaps occupied the most important place. I am now as enthusiastic as before over the treatment of eczema of all varieties and in all stages, by the röntgen ray. With the exception of a very acute vesicular eczema with marked edema, etc., I think that all cases of the disease are amenable to röntgen therapy. In a very acute case (resembling rhus poisoning) I would prefer to use wet dressings of boric acid or a calamine and zinc lotion for a week or so till the swelling had largely subsided, when I would not hesitate to begin röntgen treatment. The general opinion seems to be that the ray is only suited for exceedingly chronic, thickened patches of eczema. While it does clear up patches of this kind the most brilliant results are seen in the subacute cases of papular and vesicular type. The cases that are most resistant to the ray as well as to other methods of treatment are those of the erythematous type. I have also had disappointing results in a few cases of vesiculosquamous eruptions of the hands which I had classed as eczema. I now feel it is quite possible that some of these cases were examples of epider-

mophyton infection, though the demonstration of the fungus in this region is always difficult.

It is of course realized that in treating an eczema by the röntgen ray that we are not attempting to remove the cause of the disease. As a matter of fact we do not know the essential cause of what is called eczema. I had hoped that some light might be thrown on the subject by the protein sensitization tests. The results of some recent work along this line, in conjunction with Dr. J. Edgar Fisher, were, however, most disappointing in eczema in adults. Whether the röntgen ray removes the cause of eczema or not it certainly clears up the lesions in a large proportion of cases in a much more satisfactory manner than by any other therapeutic measure with which I am acquainted. In a few cases a single treatment effects a permanent cure. In a large number of cases, from four to eight weekly exposures are followed by permanent removal of the disease, without the necessity of any local application or internal medication. The röntgen ray treatment is not only quicker and surer in its action but is infinitely more agreeable than salves, such as tar, ichthyol, or chrysarobin. Two hundred and sixty-nine cases of eczema were treated, the patients varying in age from fifteen months to eighty-five years. The dose was a one half H unit for the first and a one fourth H unit for successive treatments given at weekly intervals. An improvement was generally noted after the first and almost invariably after the second exposure. The anti-pruritic effect of the ray has also been quickly shown in treating eczema.

PSORIASIS.

In regard to psoriasis my former opinion remains practically unchanged when it was stated that "the lesions themselves were easily cleared up but they returned with discouraging frequency. The röntgen ray appears to be especially useful for lesions of the hands and face where chrysarobin is objectionable. . . . Its value in psoriasis is certainly below that in eczema." I formerly felt that the ray was "a less valuable remedy than chrysarobin in the treatment of psoriasis," but now consider the two methods of treatment about on a par as regards efficiency. There can, however, be no question that röntgen therapy is a less disagreeable procedure than inunctions of chrysarobin ointment. It is often difficult with any method of treatment to clear up an attack of psoriasis entirely, while it is impossible to prevent future outbreaks of the disease. Arsenic is undoubtedly of value at times, while treatment by a low protein diet is of very little value in my experience, an opinion that is now shared by many dermatologists. For the solution of the problem of psoriasis we must for the present depend upon the röntgen ray or chrysarobin. It might be mentioned in this connection that the ray should never be applied to a region that has been recently treated with strong irritants such as chrysarobin, iodine, phenol, or other similar drugs, on account of the danger of a possible erythema. An interval of two or preferably three weeks should elapse between the employment of a local irritant and the röntgen ray.

It is hardly necessary to say that the ray is not

sued for treating psoriasis of the scalp, though in a few cases I have cautiously given a one fourth H unit followed by improvement. In my series there were sixty-seven cases of psoriasis treated by the ray. The dose, as a rule, was one H unit (at monthly intervals), six areas, as a rule, being the maximum number treated at one sitting. In my experience I have obtained much better results with large than with fractional doses, and in this respect differ from some of my colleagues.

Good results were obtained in the majority of cases (thirty) of so-called seborrheic eczema. The ray was fully as effective as ointments in this disease and certainly a more agreeable method of treatment for the patient. It was particularly useful where the disease was limited in extent. The usual dose was the same as that given for eczema. In some of the more deeply infiltrated cases one half H units at intervals of two weeks were given.

THE X RAY IN ACNE.

Acne is one of the few skin diseases that has been treated successfully by the röntgen ray for a considerable number of years, and I still feel as before that the ray is "the most efficient agent for the treatment of acne, and, with the modern measured dose, do not hesitate to treat any case of acne, whether occurring on the back of an older person or the face of a young girl." In point of efficiency and comfort of the patient the röntgen ray should be the method of choice. I am willing to admit that good results can be obtained by mechanical methods such as the dull curette and comedoextractor combined with soap frictions. Such treatment, however, is often disagreeable for both patient and physician, and its results are not as permanent as when the ray is used. The ordinary lotio alba so commonly used for acne has little more value than that of a placebo, while vaccines of the so-called acne bacillus I feel sure are utterly worthless from a therapeutic viewpoint. One hundred and thirty-eight cases of acne of the face, chest and back were treated. The usual course of treatment consisted of twelve exposures of one fourth H unit given at weekly intervals. At times it has seemed advisable to follow the suggestion of MacKee and omit every fourth treatment and extend the course over a period of four instead of three months. As a rule there was not any noticeable improvement until after a half dozen or more treatments had been administered.

Rosacea did not respond very well in my experience to röntgen ray, eighteen cases of various types having been treated with rather unsatisfactory results. While some of the pustular cases were improved, there was naturally no improvement in the telangiectases or large masses of rhinophyma.

LICHEN PLANUS.

Lichen planus of the ordinary type is another of the group of inflammatory skin diseases that is favorably affected by the röntgen ray. When treated by this agent the pruritus is quickly relieved and the lesions gradually disappear, though much slower than in eczema. I still feel sure that the röntgen ray is the only local remedy that causes involution of lesions of ordinary lichen planus.

Other local remedies simply relieve the itching. In the hypertrophic type of the disease my experience has been limited, one case, however (previously quoted), responding favorably. Eighteen cases of lichen planus were treated, the dose being the same as that in eczema.

Lichenification (*lichen circumscriptus*) also proved very amenable to röntgen therapy, nine cases of this chronic obstinate condition having been treated. In two cases the eruption disappeared quickly after a single treatment, while in others the results were not so rapid. The best effects were obtained by doses of one H unit at monthly intervals or one half H unit given every fortnight.

SYCOSIS AND FOLLICULITIS.

The results in twenty-four cases of sycosis (*staphylococcic*) and folliculitis were fairly satisfactory. In many cases of sycosis nothing but röntgen ray (or radium) seems to have any permanent effect at all. Some cases were cured or improved without causing the fall of hair, while in others epilation was necessary. The obstinacy of the disease was shown by a case which I treated twelve years ago by the old method of giving large numbers of unmeasured fractional doses. The patient who had suffered from this affliction for nine years had been previously epilated by an experienced colleague and in spite of this a second epilation was necessary to effect a cure. Needless to say, I could not be induced at the present to repeat such a procedure with any but the modern technic.

Three cases of the unusually obstinate condition known as cheilitis exfoliativa were treated with very satisfactory results. The scaling which had not even been temporarily helped by any other remedies was entirely removed in two cases, after five and in another after nine treatments of one fourth to one half H unit. The cases were treated recently, one patient remaining well for five months.

RINGWORM AND FAVUS.

The great therapeutic value of the röntgen ray is shown by the variety of conditions in which it can be employed. The fact that a certain quantity of the ray will cause a fall of hair is utilized in treating ringworm and favus of the scalp. In these conditions the result is certainly brilliant. Instead of treating ringworm with salves and mechanical epilation for months or even years, we are now able to cure permanently nearly every case of ringworm and the majority of cases of favus of the scalp in three months. The modified Kienboeck-Adamson technic as described by MacKee and Remer, Hazen and others, is not at all difficult, though it requires considerable patience on the part of the operator in treating young and restless children. The patient's scalp is previously clipped (not shaved) and after the preliminary markings with a blue pencil, one H unit is given at right angles to the five intersecting points upon the scalp. In about two or three weeks the hair falls completely or is loose enough to be removed with gentle traction. The scalp then remains bald for the following six to twelve weeks, after which the hair returns completely and the disease is cured. As

pointed out by Hazen it is advisable to epilate the entire scalp even when the disease is not widely disseminated, as the new hair may have a somewhat different color and consistency. Occasionally there is a reinfection and a second epilation six months later is necessary. My series includes seventeen cases of ringworm and four of favus. A few of these have been treated recently and the patients are still in the stage of temporary baldness. The others made an uneventful recovery in about three months. One of my cases was in a child three and a half years of age. While the treatment of ringworm of the scalp is not difficult, it is a satisfactory proof that the standardization of the apparatus is accurate.

Other classes of cutaneous diseases in which the röntgen ray is of great value include hyperidrosis, pruritus, the leucemic affections, and carcinoma. Localized sweating of the palms, soles and axillæ is a disease in which the ordinary remedies are only palliative. The röntgen ray, on the other hand, is the only agent with which I am acquainted that can effect a permanent cure. My experience has been limited to the treatment of seven cases. I am convinced that large doses such as one H unit every month are necessary to produce results. At the suggestion of a colleague I recently treated two cases by small doses (one fourth H unit) weekly, giving a total of ten to twelve treatments respectively, and failed utterly to obtain any appreciable results. On the other hand, a complete and permanent cure was obtained in a cello player who had suffered for two years from hyperidrosis of the palms. He was given eight exposures of one H unit at monthly intervals.

The antipruritic action of the röntgen ray is well known in inflammatory diseases such as eczema, psoriasis, lichenification, etc. In both localized and generalized pruritus without visible cutaneous lesions its effect is often most striking, as in a case (previously quoted) of pruritus of the vulva and anus of four years' duration. After a single exposure of one H unit the pruritus disappeared completely and had not reappeared at the end of nine months. At times the ray was only palliative, while in one case of general pruritus, after persistent treatment, no appreciable relief was obtained. Fourteen cases of pruritus were treated, the best results being obtained by a dose of one H unit.

LYMPHATIC DISEASES AND CARCINOMA.

That the röntgen ray has an important place in the treatment of the lymphatic diseases and carcinoma is, of course, well known. In the lymphatic diseases involving the skin, such as leucemia, Hodgkin's disease, and the allied condition of mycosis fungoides, the röntgen ray is the only remedy that has a favorable, if only palliative, effect on the lesions. There can be no doubt that the ray alone will cure a large proportion of cases of epithelioma of the basal cell type (rodent ulcer), though it must be admitted that this relatively benign form of cancer can be easily eradicated by a number of other methods of treatment. The ray will also cure a small proportion of cases of metastasizing type (squamous cell) epithelioma. In my treatment of epithelioma I have combined the röntgen ray treatment with a preliminary vigorous curettage under

local anesthesia. Immediately after curetting, the ray has been given in doses of two H units, including a border of a quarter to a half inch of normal skin, the neighboring parts being carefully screened. In some cases a second similar exposure has been given a month later.

LESS FAVORABLE RESULTS.

In a number of miscellaneous affections, my results have been disappointing, including some in which beneficial effects have been asserted by others. Although the röntgen ray is supposed to have a favorable action upon diseases characterized by warty lesions, such as common warts, senile keratosis and Darier's disease, it has not been a brilliant success in my hands. It is quite possible that my dose has been too small. In all events I have seen better results in some cases from the use of radium. I have not been impressed with the usefulness of the röntgen ray in lupus erythematosus, having personally, however, only treated three cases with little benefit. I have found radium more effective in this extremely obstinate condition. The result in five cases of dermatitis herpetiformis, two cases of sarcoid, and one case each of keloid and pityriasis rubra pilaris were very disappointing. In certain nail conditions, notably ringworm and paronychia, the results were equally bad, with the exception of a single case of ringworm involving two nails, in which the disease completely cleared up after five exposures of one H unit given at monthly intervals.

As the gamma rays of radium and the röntgen ray have similar physical qualities, it is natural that their effect upon certain skin diseases should also be similar. Owing, however, to the limited areas that can be treated in reasonable time by radium, its practical utility in dermatology is decidedly less than that of the röntgen ray. In a few conditions, such as nævus (of various types), lupus erythematosus, leucoplasia, and possibly warty and keloidal lesions, it is of much more value than the röntgen ray.

CONCLUSIONS.

1. The röntgen ray is probably the most useful therapeutic agent for the treatment of skin diseases.
2. Its versatility is shown by the great variety of conditions in which it can be used, including inflammatory diseases, those depending on epilation, pruritus and hyperidrosis, lymphatic disease and cancer.
3. It is only by means of accurate standardization that its full value can be realized and its dangers eliminated.
4. Standardized treatment requires the use of a Coolidge tube and interrupterless transformer. The quantity of ray can then be measured by pastilles or by arithmetical computation.
5. The routine use of pastilles is unsatisfactory, as considerable experience is required and as they introduce the element of personal equation.
6. By means of the simple method of computation devised by MacKee and Remer, the treatment of skin diseases by the röntgen ray has been revolutionized and a great contribution made to dermatological therapeutics.
7. The most brilliant results in my experience have been attained in eczema and in ringworm of

the scalp, where the röntgen ray is certainly the method of choice.

8. It has also been of great value in acne, psoriasis, seborrhoeic eczema, lichen planus and epithelioma.

9. In chronic sycosis, localized hyperidrosis and some cases of localized pruritus it is the only remedy (except radium) that can effect a permanent cure.

10. Leucemic conditions and mycosis fungoides cannot be even temporarily improved by anything except the röntgen ray (or radium).

I wish to express my thanks to my former associate, Dr. S. J. Nilson, and my office assistant, Miss Ruth Kane, for continuing this work during my absence in the military service, and to my associate of the past year, Dr. J. Edgar Fisher, for his assistance.

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PHYSICAL DIAGNOSIS VERSUS THE X RAY IN DISEASE OF THE LUNGS.

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Among the numerous advances in diagnostic accuracy within recent years, the x ray is by common consent accorded a high place. Its successes, however, have been much greater in some fields than in others. In the following discussion we shall limit ourselves to a consideration of the x ray in relation to diseases of the lungs.

DISEASE OF THE PLEURA.

Pleural adhesions can often be determined by careful inspection of the chest, by the observance

of the diaphragmatic shadow, and by percussion and auscultation of the lower pulmonary margin. A far greater degree of accuracy is possible, however, if the fluoroscope or plates are used. Associated with the recent influenza epidemic, cases were noted in which great thickening of the pleura occurred. These cases presented the physical signs of a pleural effusion and an x ray picture which could hardly be differentiated from that presented by fluid in the pleural cavity. It is usually impossible by means of physical diagnosis to demonstrate the presence of pleural effusions until four hundred c. c. have accumulated. The x ray will usually show the presence of fluid in smaller amounts and with a greater degree of certainty. In regard to loculated fluid collections, the advantage of the x ray is still more greatly enhanced.

Radiographic studies have confirmed the clinical suspicion that localized pneumothorax is much more common than was at one time believed and, as a rule, enables us to outline accurately the region involved. Interlobar collections of fluid are also often located with greater precision than is possible by physical diagnostic methods. The x ray also has a useful field in connection with artificial pneumothorax, since it enables one to detect adhesions which may make the procedure useless, and it also enables one to determine accurately the degree of lung compression which has been attained.

PULMONARY ABSCESS.

In this condition great help is usually afforded in determining the exact site, size, and proximity to the surface of deeply situated pus collections.

FOREIGN BODIES IN THE BRONCHI.

Another signal triumph is here accorded to the x ray. Not that foreign bodies are never overlooked, because they are, especially when organic substances, such as peanuts, have been inhaled. Nevertheless, x ray results are infinitely better and more accurate in this field than physical diagnosis is, or can ever hope to be. Without a history of a foreign body having been inhaled, the elusive peanut may readily be overlooked, but when such a history exists the foreign body can nearly always be localized by radiographic methods.

Attention has properly been called by David R. Bowen (1) to the necessity of an x ray examination in all cases of persistent bronchitis, without demonstrable cause. More frequently than one would suspect such cases are due to the presence of a foreign body.

PNEUMONIA.

By means of x ray observations our knowledge of the gross pathology of lobar pneumonia has been advanced. We have learned that many, if not all, pneumonias begin as central lesions and spread toward the periphery. As a result of this knowledge we know definitely why early pneumonias often yield no definite physical signs and why bronchial breathing often appears several days after the onset, if not actually after the crisis.

While an acute process in the lungs is under way, no clinician will venture an opinion as to the degree of antecedent pulmonary lesions. Nor will the radiologist. But later, when it may become a

question of unresolved pneumonia, interlobar abscess, pleural exudation—fibrinous or fluid—or of chronic pulmonary tuberculosis, the clinician is often immeasurably aided by the radiologist.

MEDIASTINITIS, ADENITIS, ETC.

The clinical methods of determining the presence of mediastinal abnormalities before they have reached an advanced degree, are but meagre. Spinal percussion, d'Espine's sign, Eustace Smith's sign, and others, are of doubtful value and uncertain significance. The presence of mediastinal adenitis or neoplasm, or their differentiation from thoracic aneurysm, is usually, if not always, determined definitely by the x ray.

ADVANCED TUBERCULOSIS.

The actual degree of involvement and the exact location and size of cavities, although often of secondary importance, are often more accurately established by means of the x ray. In patients dying of tuberculosis, involvement is often more extensive than physical signs would lead us to believe.

BRONCHIECTASIS.

In the early stages of this condition the uncertainty of x ray diagnosis equals that made by clinical means. In the later stages, when bronchial thickening, glandular enlargement and cavity formation occur, a doubtful clinical diagnosis can often be substantiated.

"Röntgenograms, although invaluable in certain cases, may be very misleading at times when the disease has spread so as to affect the upper as well as the lower lobe. When showing clear apices the plate is of extreme diagnostic value in ruling out tuberculosis. Slight shadows at the base, however, which are all one frequently sees in typical cases of bronchiectasis, cannot usually be correctly interpreted, and very often definite sacculations, found on physical examination and confirmed by anatomical investigation, cannot be seen either on flat or stereoröntgenograms" (2). The fault most commonly committed is that of insufficient observation. If repeated examinations over prolonged periods are made—before and after expectoration has occurred—many more cases will be demonstrable by means of the x ray.

PNEUMOCONIOSIS.

Clinically the differentiation between dust disease of the lungs and tuberculosis, or the coincident presence of both conditions, is usually made with difficulty and after prolonged study. In this study the x ray may be a useful adjuvant, but in many cases, especially those in which the apices are involved, the radiograph may leave us quite as much in doubt as before the examination was made.

Concerning the foregoing statements there can, it would seem, be no difference of opinion, but when we come to early pulmonary or lymphatic tuberculosis, the question of its activity or latency, its differentiation from anthracosis, syphilis, or fungus disease, opinions differ widely.

Some time ago a number of clinicians in Philadelphia, who were interested in pulmonary diseases, examined the patients in a series of cases of suspected early tuberculosis referred to them by an

independent observer at the Phipps Institute. Later these patients were examined radioscopically by a number of x ray specialists in the city, and finally all met together to discuss their findings. The procedure was a most instructive one. As a general rule, the more experienced the examiners in each branch, the more closely did their findings tally. The two facts which most forcibly impressed us clinicians were, first, the different interpretations of the same plate by different radiographers, and, second, the greater conservatism of the more experienced radiographers.

From the discussion which took place, it became painfully evident that some of the x ray specialists had not even the haziest conception of the pathology of tuberculosis. It was doubtless some kindred experience that once led Sir William Osler to remark that no class of the medical fraternity was so much in need of the "salutary lessons of the dead house."

In a recent article based upon a study of about six hundred cases at Camp Lewis (3) it is stated that tubercle bacilli are inhaled deeply into the distal bronchioles of the lower lobes. Thence infection travels with the lymph stream to the hilus, but from there it travels against the lymphatic flow to the apices.

In defense of the radiologist, however, it should be stated that too often the clinician, especially the man who has been poorly schooled in the subject, insists on a positive answer from the radiologist. Naturally, in many cases, if a definite yes or no is demanded, mistakes are the inevitable result.

There are scattered through the land a great number of x ray stations where much good and useful work is done; but relatively few of the men who operate them have or can have the careful, prolonged, intensive training and the correlation of autopsy material to make their x ray plates, or the deductions they make from them, of any great value. To their credit, be it said, some of them admit this.

Nor is it necessary to state that relatively few internists are expert diagnosticians of early tuberculosis. Our war experience, which showed the necessity of reeducating physicians by means of special courses in the elements of physical diagnosis, is a sad and sufficient commentary. Nevertheless, one finds as a rule far less cocksureness in the average physician than in the average radiologist, when the diagnosis of early tuberculosis is in question. Mistakes are common to all. In one case of which I have knowledge, the x ray diagnosis of acute miliary tuberculosis, which was scoffed at by an eminent physician, was corroborated at autopsy within two weeks. And several times I have seen an x ray diagnosis of extensive tuberculosis of both lungs, made on fat, fever free, hard working, and practically symptomless patients. Quite recently, in Philadelphia, a patient in whom a diagnosis of tuberculosis was made at a well known sanatorium and corroborated by the radiologist of the institution, was cured by the surgical drainage of an interlobar empyema undertaken on the advice of an internist. Again I have known of cases which were clinically diagnosed emphysema to be shown by x ray and autopsy to be miliary tuberculosis.

Between the two extremes of x ray being everything and physical diagnosis nothing, and vice versa, there must be a middle ground of truth. No one who has received x ray reports from competent radiologists during the last five or six years, but feels that the technic is better, the observations more accurate, and the pronouncements more conservative. One does not now hear so much about root shadows, areas of congestion, calcified lymph nodes, and other visionary interpretations, to use another expression of Sir William's. That the x ray can demonstrate incipient tuberculosis before it is clinically possible, has, to say the least, not been proved. Other types of acute infection may produce a reaction in the lymph channels and in the fibrous tissue surrounding the arteries, veins, and bronchi. Further, it is in just such cases that diagnostic aid is most desired. Nor has it been shown that the activity or nonactivity of a tuberculous process can be radiographically determined.

Some influenzal infections may cause a slight clouding of the apex, slight flattening of the first rib, a shrunken apex, and small areas of apparent pulmonary consolidation. Such findings are identical with those often presented by pulmonary tuberculosis. The x ray findings are characteristic of tuberculosis only in the later stages. It may show very slight changes which cannot be detected by ordinary clinical methods, as well as the exact site of the lesion, but not the gravity of it (4). The stethoscope will remain the chief instrument of pulmonary diagnosis, because it gives a better idea of the activity and nature of the process, though not the exact extent of it (5).

In the vast majority of early cases the old methods of diagnosis yield satisfactory results. Only rarely is the x ray essential. Occasionally the x ray gives positive information not otherwise obtainable, and at times it helps to corroborate evidence in suspected cases, but, on the other hand, one finds cases clinically definite in which the x ray reveals nothing. A few conglomerate tubercles and a local increase in moisture do not show upon the plate.

There can be no question that the accuracy of the x ray diagnosis of pulmonary tuberculosis has advanced greatly within the last few years, this relative advance being far greater than has that of physical diagnosis in the same time. The use of anterior or posterior stereoscopic plates, of plates made at different angles, of observations made during an arrested inspiration or expiration, as well as the use of serial records made at intervals of weeks or months, has added greatly to our diagnostic ability. The combined study of a case by means of physical methods and the x ray has such manifest advantages over either method singly, that they should be jointly employed whenever possible, but if only one method is to be chosen, the older method is still the preferable one. This was tersely emphasized in a remark made not long since by one of the leading radiologists of the country: "No x ray man shall ever send me to a sanatorium."

In closing, it may not be out of place to say a word regarding the isolation of the radiologist. Too often, I fear, he is called upon for a report, which we receive and file, and thereafter he dis-

appears from the scene. Regarding the antecedent history of the patient he may be but scantily informed, and regarding the future progress of the case or the findings at the autopsy he is often left in entire ignorance. It may be his fault, or it may be ours, but it would seem that the point is worthy of consideration.

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ROENTGENOTHERAPY.

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The success that is being obtained in various parts of the country at present with röntgenotherapy is due to four factors: 1, The interrupterless transformer; 2, the Coolidge tube; 3, filtration, and, 4, crossfiring in deep work.

The first interrupterless transformer was put out about thirteen years ago by H. Clyde Snook, of Philadelphia. Owing to the construction of this machine it is possible to deliver large quantities of electrical energy over long periods of time without variation in voltage. Since the advent of this machine others have appeared from time to time, all being more or less efficient in röntgenotherapy.

With the invention of the Coolidge tube, we had, for the first time since the appearance of the interrupterless transformer, a tube which was able to receive the heavy output of the transformer over long periods of time without variation. From this time on, röntgenologists were able to give massive doses of the rays at will. Doses are now given at one sitting which formerly were impossible. And so the instruments were at last supplied whereby we were placed in a position to do great good, and also great harm by imperfect technic.

Filtration has received a superabundance of attention from all and, as might be expected, is still being improved from time to time. About the only point upon which all agree is heavy filtration for deep work and lighter for superficial work. Sole leather has been used, aluminum, glass, various papers, felt, and combinations of any or all of the materials just mentioned. At present in this country, sole leather, aluminum, and glass are favored, usually in combination. Personally, I use for superficial work a layer of sole leather and either one millimetre of aluminum or two millimetres of pure glass. In deep therapy, I use as a routine four millimetres of aluminum, two of glass, and a layer of sole leather.

Crossfiring has for its purpose the application of a sufficient dose of the rays to a pathological process lying well under the superficial structures without injuring the skin. We attempt to deliver

into the diseased area enough of the rays to destroy it. This is done by blocking out areas on the skin, through each of which is delivered as much of the rays as the skin will stand. Over each area the tube is tilted so that an enormous amount of the rays is delivered to the diseased area.

In spite of the fact that most writers describe at length the technic used for each disease treated, I find that with slight variation of the technic, at times, that all röntgenotherapy naturally falls into three groups, viz: 1, superficial; 2, deep, and, 3, superficial and deep combined. In superficial work we want our maximum dose to be absorbed by the skin. We may use a light filter made up of a layer of sole leather or one of either aluminum or glass. Generally I make use of a layer of sole leather together with one millimetre of aluminum or two millimetres of pure glass. In superficial work we do not make use of crossfiring but if the diseased area is too large to cover with one exposure we must block off areas on the skin, and then administer a dose of the rays to each, until we have covered the entire area. To give a dose of the rays to any one area we can make use of one of two methods: 1, The massive dose method in which an erythema dose is given at one sitting, or, 2, the fractional dose method. As all skins do not respond equally to a given dose of the rays, I prefer the fractional method in superficial therapy, as by this method we can keep close watch on our patient and can give just enough. Enough is generally an erythema dose. This is done by setting the machine so that the tube will back up five inches and will draw two milliamperes (at a focal distance of eight inches). The exposure should last three minutes. This is repeated every other day until the erythema is seen on the skin. Ten such treatments will produce a marked erythema, and sometimes as few as four will give the desired result. In a month's time we can repeat the series if necessary. The parts not under treatment must of course be protected with lead sheeting and leaded rubber sheeting.

In deep röntgenotherapy we deliver into the diseased area a sufficiently large dose of the rays to destroy the disease. This must usually be done without harming the skin, although at times, when the pathological process is not too deeply located, we may, with advantage, continue our treatment to the point of ulceration. An ulcerated area generally clears up as readily after röntgen treatment as does the burn following massive doses of radium. To do this we make use of a heavy filter, a hard tube, and crossfiring.

According to Pfahler, of Philadelphia, the filter should consist of six millimetres of aluminum or the equivalent of glass. I generally use two millimetres of glass, four of aluminum, and a layer of sole leather. The tube should be made to draw five milliamperes and to have a parallel spark gap of nine inches or the equivalent of 90,000 volts. At a focal distance of eight inches with the Hampson radiometer it will require five minutes to give an erythema dose to a given area. In treating malignant disease I sometimes give as much as two and three times the pastille erythema dose, that is, fifty to seventy-five milliampere minutes respectively.

Owing to the fact that the tissues overlying the diseased area will absorb the rays, we must crossfire in order to get the required dose to the disease. This is done by blocking out on the skin areas as large as can be covered with an exposure protecting the other areas with lead strips and so passing from one area to the next, giving to each area at least an erythema dose or as much as is indicated by the disease under treatment. Crossfiring is done by so tilting the tube that through each area the rays will be focussed on the seat of the disease. Unless I am treating malignancy, which I treat as just mentioned, I let the tube deliver to each area forty milliampere minutes. As said before, the areas not under treatment should be covered with lead sheeting, i. e., the parts directly under the tube, and the remainder of the patient's body should be covered with rubber sheeting heavily impregnated with lead.

In conclusion I wish to state that nothing that is not positive fact has been put into this paper; that it is free from anything that is in the experimental stage of development. I have tried to make it understandable by the practitioner and the specialist other than the röntgenologist so that they might have in one small paper the facts of röntgenotherapy without being bored by voluminous reading in order to get a little meat. For this reason I have tried to cut down the detail as much as is possible with a basic understanding of the principles involved.

ILLUSTRATIVE CASES.

CASE I.—Mr. F. K., came to me on June 6, 1918, with a large eczematous spot upon his right foot which had been present for years. Technic, routine superficial; result, vivid erythema resulted following the fourth dose and treatment was stopped. Eruption has never reappeared.

CASE II.—Mr. A. M., referred with a large spot of psoriasis upon the left elbow. Disappeared before an erythema dose had been given. Technic, routine superficial, one series of ten treatments being given.

CASE III.—Mr. T. D., came to me with a large ulcer on the right temple which had been diagnosed as lupus. He had had x ray treatment elsewhere but as no erythema was present I subjected him to the usual superficial treatment. The fifth dose was the last, as the lesion had entirely healed and patient stopped treatment in spite of the fact that he was earnestly advised to continue. Final result I cannot report, as I have lost track of this patient.

CASE IV.—Mr. L. H. E. was referred with a small ulcer on the lower lip, a section of which showed it to be epithelioma. Technic, removal of diseased area with the actual cautery; routine superficial therapy; deep therapy over front, back, and both sides of neck. Result, patient was well eleven months after last treatment.

CASE V.—A. E. came to me with a cervical adenitis and fistula which was probably tuberculous. Technic, routine deep. Result: Two months after last treatment swollen glands had disappeared, fistula was closed, and there was very little induration at that time.

CASE VI.—Mrs. J. Mc. had had x ray treatments for a long time for an exophthalmic goitre, but with-

out result. Symptoms of hyperthyroidism gradually increased in spite of treatments. There was no evidence of there having been an erythema. Technic, routine deep. Several series of treatments were given once a month over the tumor and down over the mediastinum, five series in all being given. Result: Two months after first series patient felt well, ate and slept well; pulse was normal; tumor a little smaller, possibly. After three more treatments tumor became the size of a large marble; it was the size of a grape fruit at the beginning of treatment.

CASE VII.—Mrs. P. S. C. was sent to me for x ray treatment of a fibroid on the posterior wall of the uterus. The tumor was about the size of an orange and the patient suffered from severe menorrhagia and metrorrhagia so much that she was seldom free from the discharge for more than three days out of each month. Technic, routine deep; seven series. Result: Bleeding stopped entirely two weeks after first series and at present the tumor is barely palpable.

CASE VIII.—Mrs. A. A. J. had been operated upon for cancer of the right breast. Two months later recurrence in mediastinum was diagnosed. Technic, deep, front, back, and both sides of chest. Five series were given, one series each month. Result: Deposits in mediastinum disappeared, but patient died of a recurrence in the rectum which I was not permitted to treat.

CASE IX.—Mrs. C. A. C., referred for palliative treatment of an inoperable cancer of the uterus and pelvis. Technic, deep, fifty milliamperes minutes given through each of ten areas from navel to pubes, front and back. Treatment resulted in a marked tanning of the skin. Result: Well two years after last treatment.

FOODS AND RACES.*

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Of the two great hungers of the human race the desire for food is paramount. Extreme scarcity leads to grave contention; at the point of starvation all the primitive instincts are aroused, and the individual may steal or rob to satisfy hunger; the group will lose sight of justice, and use every compelling force for relief; in the last extremity the individual will turn to cannibalism.

Anthropological and biological investigation point clearly to the unity of aboriginal man. A single species of a single genus, influenced by varied environment, became the divergent races we now see, and one of the strongest factors in the causation of racial variation is the quality and quantity of food. Of course divergence has been in part due to climate, but the greater climatic effect is through the influence of local food production with geographical isolation.

In considering racial distinctions in relation to food, it is not sufficient to compass the life and environment of man within historical knowledge; nor does it suffice to study the evidences of the less remote prehistoric times of the Cro-Magnon,

Neanderthal, or Piltown man. We must run back the line to earlier prehuman forms, even beyond the Javanese ape-man, and think of the painful and precarious evolution before the mind of man had developed sufficiently to utilize the products around him, or to travel far in search of food, when geographical restrictions and ignorance were cruel factors in life. In this way we can understand the small stature of island peoples, limited to little space, with sparse supply of food; and the same conditions among people of larger areas of infertile, overpopulated territory, suffering hunger for long periods of time.

The subject is so broad, and touches so many phases of the development of man, that it is proposed to limit consideration mainly to racial stature and some allied subjects; and to suggest a probable cause of the emotionalism of certain races.

In order to understand the effects of food supply on racial evolution, it is necessary, first, to note the requirements of the individual. A well balanced and safe ration is composed of fifteen per cent. of proteins, twenty-five per cent. of fats, and sixty per cent. of carbohydrates, with a daily allowance of forty calories to the kilogram of weight, a range of two thousand to three thousand calories, according to size and vocation. In occupations of hard physical labor, an addition of one thousand or fifteen hundred calories of carbohydrates and fats are necessary to furnish energy. The haversack ration of the American soldier in the recent war had a fuel value of four thousand four hundred and forty-eight calories.

The individual must be well nourished to thrive, as can readily be seen in any community; the progeny of the poor develop slowly and growth is inhibited; the children of the well to do grow rapidly and attain a larger size. In the growing years it is highly essential that the dietary contain an ample supply of lime and phosphorus for the skeletal frame. Another item of great importance is the vitamins, only recently discovered, and found in the covering of grains, fresh vegetables, milk, citrus fruits, probably animal proteins and other products.

It is well to understand how food is utilized in the process of growth and repair. This is one of the many functions of the wonderful system of ductless glands, especially the pituitary, the thyroid, the sex glands, the pineal, and the thymus. This physicochemical or electrochemical system is known to perform this service through countless cases of arrested development, where one or more of these glands were diseased, and by the direct and remarkable development that occurs in glandular feeding in such cases. No more interesting fact is found in the whole field of medicine than the influence of the endocrine glands in physical and mental development. The growth of the body may be retarded, or decidedly altered, by deficient working of any one of these glands, or even by unbalanced function. It is known that the pituitary governs the development of the frame; overfunction leads to gigantism and underfunction to dwarfing. It is definitely settled that the thyroid is concerned in stature also, and that it determines the traits of hair, skin, features, and mentality, thus

*Read before the San Antonio Scientific Society.

differentiating races. The pineal, suprarenals, and sex glands, all play an important part in growth and the maintenance of function. This is all accomplished by utilizing the minerals in the food supply, applying them to the appropriate tissue. So vital is this fact that it has probably been the chief means of race divergence. It is not improbable even that it is at the root of the cephalic index of races; that the brachycephalic and the dolicocephalic heads date back to some very remote period of anthropogeographical isolation for ages when the endocrine glands were working industriously with the poorly differentiated material available in the food supply. The dwarfing of races has evidently been caused in considerable part by lack of proper stimulation of the pituitary body and other glands by proper food supply.

In studying the stature of races, the Japanese Empire furnishes us the best example of insular island life. The area of tillable soil is only about fifteen per cent., and a considerable part of this by expert terracing and by irrigation. The rest of the surface is mountainous, volcanic, nonproductive, and even unfavorable to the propagation of wild animal life for sustenance. The lowlands in many places are untillable on account of the rocks washed down from the mountains by torrential rains. Pasturage vocations have been impracticable because the arable land must be used for agriculture; and the volcanic wastes and the bamboo in the lowland is a further barrier, and stock for food cannot be raised, fish being the main supply of animal proteins and fats. It is conceivable that the Japanese have lived on this restricted territory for countless ages, and have suffered from food shortage for long periods, and from recurring famine; and the population has likely run beyond possible production at different periods. We may get some idea of what this race must have suffered in food deprivation in earlier time by our knowledge of the incidents of the two hundred and fifty years of seclusion. From sheer necessity agriculture in Japan during that period attained a degree of perfection found nowhere else at any time. Less than three acres were allotted to the family, and every foot of arable land was kept under intensive cultivation by skilfully fertilizing the individual plants, by constant manual turning of the soil, by irrigation, and by every possible artificial aid to nature; and those things were planted that promised the greatest returns, as rice, beans, and other grains, and nourishing vegetables and fruits. And in spite of the greatest production by these ingenious people, during one known period of one hundred and twenty-three years, from 1723 to 1846, the nation made little progress, and the population declined at times. Infant mortality was high, and means were employed to limit population because of the scarcity of food. It is believed that racial stature was affected to some extent during the seclusion period, though this is a slow process and probably depends upon long ages. During the next fifty years, after the policy of seclusion was abandoned, living in intimate association with continental peoples, and with ample food supply, including a large quantity of Australian cold storage meats, the population of the

Empire made tremendous gains, and it is asserted that the stature has improved, though this is doubtful, and intelligent progress in every department of life is one of the startling things in history. Another thing of great importance in fixing the stature of the Japanese is the lack of animal proteins. For the reasons given, they have been without the animal proteins so essential to full development of stature. It is a notable fact that in moderately cold countries, where large quantities of meat are consumed, other things being equal, man is of large stature, as the North Chinamen, some of the Russians, the Teutonic peoples, Anglo-Saxons, and other north country mixed breeds.

Notwithstanding the contention of vegetarians, science has proved the great value of animal proteins in tissue building and in the sustenance of life when consumed in reasonable quantity. It is remarkable with what unanimity all people, both savage and civilized, have unconsciously adjusted themselves to something like an even ration of protein foods, usually about ten to twenty per cent., and the most eminent physiologists of the world have uniformly contended that the proteins are essential to physical wellbeing. There is a quality in animal proteins that stimulates cell life and function, and promotes physical and intellectual development that does not exist in fats, carbohydrates, or minerals, unassisted, probably operating through pituitary stimulation. The population of the Central Powers in the recent war suffered intensely from the lack of fats and proteins especially, and now it is found, after the starvation period, that an abundance of fats and carbohydrates does not rebuild without the addition of meats. Even when inbreeding, selection and restrictions of climate are considered, we must admit that the Japanese stature has been limited by the several causes mentioned.

The same proposition applies to other island peoples similarly situated, and many less striking examples can be found. A fact of singular interest is that where Oriental races have drifted away in early periods to more productive lands, where game and fruit were abundant, a larger growth has been attained. No finer physical men exist than some of the Pacific Islanders, especially the Polynesian New Zealanders.

The small stature and slender build of most Asiatic peoples, such as the Chinese, the Hindus, and others, as related to food supply, is due to several causes; overpopulation and hunger over long periods; a monotonous rice diet; the lack of animal proteins, the meat animal in the Orient being absent or held sacred, aesthetic tastes barring animal foods.

The races that have attained the best development and made the greatest intellectual and commercial progress have been favorably located, with ports open to all the world, attracting ample supplies of a great variety of foods including proteins, as the Greeks and Romans, and the well favored modern peoples.

A monotonous food, though of animal protein, is not wholesome, for the Arctic peoples, the Eskimoes, Laps, and others, whose food is highly nitrogenous, are of short stature. It is probable, however, that

this is in part due to the hunger of the long winters, recurring famine, and the age long conflict with the cold. Dr. Helen Churchill Semple, a profound student of races and a distinguished authority, says that the dwarf races of Africa live almost exclusively on meat, a monotonous diet, and that the supply is often precarious. She is referring to the Bushmen who are desert hunters, the Watmas who are hunters of big game, and to the Hottentots who are herders on uncertain grass lands. These races have all suffered much from scant supply and monotony of food, and while they have not had to contend with intense cold, they may have had to endure a good deal from climatic disease.

Alpine people are of short stature, and the higher the altitude the shorter the measurements. In the more moderately high altitudes they have a little meat and some vegetables, but in the higher altitudes the lack of pasturage makes it too expensive to raise food stock, and they subsist largely on dairy products.

Many examples might be cited showing the influence of the food supply on racial growth of island, continental, mountain, desert, and coastal peoples. The Jewish people have suffered a decided shortening of stature from two causes, prolonged persecution and hardships in various countries, and from the inhibiting influences of city life; and yet they are singularly long lived on account of their custom of carefully selecting food, and the sanitary precautions taken in their food, especially meat.

It is probable that the influence of heredity and environment operating through biological law, using the materials at hand in various parts of the earth, has permanently fixed the stature of the various races. Transportation facilities will furnish ample and varied food supply, except when interrupted by war, and there will be no further radical change. Nevertheless, there will be some modifications, and the advantage will be with those people who for reasons of location, soil, water, climate, etc., have a large and varied supply of food with a good lime, phosphorus, and chlorophyl content, and whose marvelous workshop, the endocrine gland system, is not handicapped by disease. It would be interesting here to speculate on the probable degree of the leveling up of the human races in the future. We started as one, we separated into many, and the trend will be to unite again, in spite of strong ethnical tendency. Anthropogeographical limitations will no longer bar any branch of the human family from a good varied food supply long at a time. Napoleon started something greater than his wars when, urged on by his great necessity, he originated the canning and preserving industry and beet sugar, for this made possible the universal feeding of all races at all times. Trade and the intercommunication of peoples will favor the equal feeding of all, and the interbreeding of the past indicates that races will tend to vanish under the stimulus of a broader democracy and greater facilities of transportation of foodstuffs. We shall move back a considerable point toward our original place in the ages to come, in blood and in stature, but the mark of progress will never be lost, and the present racial traits will persist.

The agonizing hunger and suffering of millions on account of the recent war, illustrates what might happen if the Malthusian idea is correct; but the possible supply of food in the world is now enormous, rendering that theory untenable. New items are constantly being added to man's dietary. It was long after the conquest of Peru that the white potato spread out from the land of the Incas to the uttermost parts of the earth nourishing all races, and now it is threatening the horse with its alcohol power; the universally popular tomato was growing wild in South America and little known scarcely more than a century ago; grain culture is constantly improving and extending, and everything is Burbanked; the growth of banana cultivation and the possibilities of banana flour are immense; the cattail is coming into its own, and plants of thousands of kinds are under investigation, and we have but touched the vast supply of food in the sea and the mighty rivers. And the synthetic process in the chemical laboratory promises marvelous things. There can be no danger of a starving world till that very remote time when the earth itself shall perish for lack of moisture, as foreshadowed by the immortal Byron.

One point we want to emphasize especially in this discussion of food in relation to races is that the emotionalism of the Latins and other people of the temperate zone, and of tropical peoples, is due to the large intake of sugar, which has always been available in abundance. Not only is sugar always at hand, but the natives consume large quantities of raw ribbon cane in sugar growing countries. We will lay it down as a definite proposition that this large consumption of sugar, a quickly acting fuel, stimulates and overdevelops the pituitary body and its functions. This little organ at the base of the brain is a partly glandular and partly nervous structure, and it is known to be the centre of all sensation and emotion, and at the same time it rules and directs all the activities of the whole system of ductless glands, and the vegetative nervous system, governing all the functions of organic life. It also serves as a communicating centre between the brain and the other organs. The constant stimulation of sugary products over centuries of time has overwrought this important organ and overdeveloped it in some of its functions, and thus races have been permanently affected.

As a proof of this contention, the difference between the Romans of two thousand years ago and their Italian successors might be cited. The Romans were a peculiarly stoical, strong, and unshakable people, and we know the Italians of the present day are very emotional. The Romans had no sugar, for it was not introduced into the Mediterranean Basin by the Saracens till about the eighth century, and was not abundant till it came from the West Indies later. The Romans of course had honey and raisins, but the quantity was limited, and not in such universal use as to affect the race. Sugar has been pouring in a stream down the throats of the Mediterranean peoples for hundreds of years, not only from the table, but in candy and drinks. History will show that the French have undergone a similar change, and perhaps the Spanish. The emotional

mentality of tropical peoples is well known. It is not only a reasonable belief, but a fact easily demonstrated by scientific observation and will be proved, that the excessive use of sugar could produce such results. Only recently a Bengalese scientist has found that the blood of tropical peoples contains a higher per cent. of sugar than others. The rapid increase in the consumption of sugar may portend evil for our own country. The American people are now consuming annually eighty-five pounds per capita, an increase of sixty-seven pounds in forty years, and still there seems to be no limit. In fact, it is increasing more rapidly since we have prohibition, and many are using it unconsciously as a stimulant. Its almost universal excessive use threatens serious detriment to the various organs with impairment of function and degenerative disease. And ultimately it will affect the emotional side of life and tend to make us unstable as a people. It would be well for those who think to give some thought to this proposition, and warn others of the dangers ahead.

Perhaps increased emotionalism has enriched the world in romance, poetry, art, and music. It were better that the human race suffer some deterioration than to have been without the rich romance of French literature, the entrancing stories of Ibanez, the passionate truth in the art of Italy, France, and Spain, and the matchless melody of Mexican music. But it is wise to moderate our excesses in the use of this valuable food and safeguard the health and stability of our people.

STERILITY, SEX STIMULATION AND THE ENDOCRINES.

BY THOMAS W. EDGAR, M. D.,
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In presenting this paper to the profession I feel that it is my duty to preface what follows by a few words in reference to the subject, in order that conditions regarding the contained facts be realized. Almost thirty years ago, Brown-Séguard published in the *Archives de Physiologie* a treatise dealing with his research on testicular organotherapy. He went so far as to offer himself as a medium, and had injected into his body a preparation prepared from the testes of a dog. He reported that almost instantaneously he was endowed with renewed vigor and virility: in his own words, "Considerable laboratory work produced hardly any fatigue, and to the astonishment of my two assistants I was able to work for several hours in a standing position."

Unfortunately, the charlatans of Paris commercialized this fact by promptly seizing Brown-Séguard's announcement; as a result the real significance of the facts established by this master was drowned by the acts of these unethical practitioners to mulct their susceptible patients of more money. Thus his work and its result fell into disrepute, and up to the present this bad reputation has stayed with organotherapy, whether it be testicular, or what not. Nevertheless, to those of us who have become interested in endocrinology, the facts presented in rough form in 1888 have formed a

basis on which to work miracles in spite of the ever unfortunate and cold reception given the perpetrator of any new method of procedure of robbing life of its degenerations or bringing back the sex instinct with its consequent happiness of mind and healthiness of body.

Volumes have been written on the subject, and there have been many criticisms offered. Testicular and ovarian organotherapy have suffered most. In my estimation three fourths of the unkind things said about this branch of endocrinology have been the result of expecting the miraculous to happen, and the setting of one's hopes too high. Again, many failures have been due to slipshod methods and treatment. Results have not been obtained in short intervals, and as a consequence the treatment has been abandoned.

AN INDIVIDUAL IS AS OLD AS HIS OR HER INTERNAL SECRETIONS.

Senility and presenility, in my estimation, are nothing more nor less than a waning of the endocrine function, accompanied by functional cellular inactivity, with the resultant increase in toxemia, which poisons and degenerates; repair, if it does take place, is slow, and the organs gradually fall into disuse, followed by atrophy. Ideals, ambitions and desires are but memories, while procreation is impossible.

When the ability to procreate wanes, the individual is then to be considered senile, unless the causative factor is a specific disease. This hypogonadism may exist at any period. It is seen during early adult life and is then due to indiscretion, or is the result of presenile changes in the internal glandular system, as portrayed by malnutrition, wrinkling and shrinking of the skin. The eyes become dull and the movements slow, while the spermatogenic function, as well as the ovarian sequence, disappears. This presenile stage may be also initiated by indiscretion, as shown by the sex glands becoming functionally inactive, and the case may present the same hypogonadism that is found in pathological conditions.

I quote the following from an author who is evidently of the same opinion as myself:

"The diagnosis need not be discussed further, and its successful control through a mythical *elixir vite* has been the goal of many from time immemorial, and from Ponce de Leon to the present day. Hypogonadism may be amenable to organotherapy even in elderly men, and the fundamental principles of homostimulation holds good in proportion to the responsiveness of the glands thus stimulated. It is a broader matter than the gonads alone, as the thyroid, pituitary and other endocrine glands all play their part. Senility then is hypocrinism rather than hypogonadism alone, and if we must treat it, it should be treated in the larger sense, and when organotherapy is in mind, it should be pluriglandular therapy.

Thus the failures of the past have acted as stepping stones to a more thorough investigation and firmer understanding of the subject. The solution of the vital functioning of the body depends on endocrine secretion, as do the senile and presenile phenomena.

Senility or old age is inevitable. It is the logical termination of the human organism. The allotted time of threescore years and ten, however, is only traditional, and there is no scientific reason why the human being must wither and cease to become a functioning factor after this time. We have accepted the age of seventy as the time for dysfunction, because we have had no specific therapy to combat its ravages. In other words, we have accepted the ultimatum because we have had no argument in the form of resistance to combat its ravages.

Senility is not dependent on the age of tissue, but on the condition or nutrition of that tissue by internal glandular functioning. Lack of functioning is inevitably followed by atrophy, while atrophy is followed by death. Dysfunctioning of the endocrine system regardless of age is followed by senile or presenile changes. In the young we find these conditions simulating changes that take place in late life, all due to singular or pluriglandular dysfunction of the internal glandular system.

The internal glandular system throughout life is capable of rendering its specific stimuli against a certain amount of resistance. If called upon, or taxed at any period of time, beyond its maximum output, fatigue results, with a retardation of function. Following this senile changes occur: a concrete example being in the roúé whose spermatogenic function is at a minimum, also as shown in the neurotic individual who suddenly flares into tempers, only to call forth the adrenal secretion which in the end fatigues the gland, and due to a decrease in pressure caused by said fatigue the patient becomes asthenic. Again the unconscious dysfunction, such as decrease in the secretion from the anterior or posterior lobes of the pituitary, the thyroid persistence of the thymus, all have their effect on tissue nutrition. Activity of mind and body are registered on the dial of life in proportion to the nourishment of said tissue (not the age of tissue) which is dependent in great part by activation by the endocrines.

Death in the broad meaning of the word as applied to the animal organism is always specific; it is due to lack of internal secretions to prevent their atrophy and death. Death is always due to cessation of vital function, caused in each and every case by the absence of that factor which under normal conditions activates or keeps active vital function, the endocrines. Disease, aside from severe traumatism, causes in the organism a toxic condition which retards by action of the degenerative changes produced the delicate metabolic equilibrium, and as a result death ensues either from paralysis of the respiratory centre or a failure of the myocardium. In other words, the endocrines are reduced to a minimum, activation ceases and death ensues.

In nineteen hundred and fourteen it was my privilege to be in Bahia, Brazil, at the time Dr. Fernandez, a Spaniard, was using with some success a serum (pluriglandular) in treating sex conditions, such as sterility in the young female. His method was to give an injection of his product intramuscularly twelve hours previous to the act of inter-

course. He was able in a series of twenty cases to induce pregnancy in two women so treated. All applicants were examined previous to injection, and any visible gynecological condition, such as atresia, or malpositions of the uterus were eliminated.

Dr. Fernandez's work on the internal secretions interested me, and as I was personally interested in metabolism, I devoted my time to its study: not, however, from the viewpoint of sterility, but metabolism in general, especially diabetes mellitus. In March, 1919, I published a paper dealing with the treatment of diabetes by the Edgar serum. At a later date a second paper was presented dealing with cases treated. At this time I was impressed with the number of patients who showed improvement in their sex relationship. Other patients manifested improvement in their mental condition. I became interested and found that many patients had regained the power of erection and ejaculation. I became interested in the surprising results and immediately studied a series of cases that were not diabetic, in order to check up my results.

My idea in presenting this short paper is simply to place myself on record as being interested in sex stimulation and at present using a pluriglandular endocrine serum with success in the treatment of this condition. It was not my intention originally to depart from the specific therapy of diabetes, but my unusual observations in the cases treated have been so promising in producing a state of wellbeing in my elderly adult patients, that I feel entitled to state that I have a distinctly beneficial serum for the alleviation of presenile and senile deficiency: and that my product is capable of producing a new lease of life in those whose functions have been reduced to a minimum.

Previous to reviewing several cases, I may state that as I did not decrease the diets of these individuals, or try to build up their tolerance by starvation, I do not feel that their improvement was due to this form of therapy. Secondly, the last three patients were not diabetic, and presented no evidence of any objective or subjective disease, aside from their presenile conditions.

CASE I.—Male, aged eighty-four. Consulted me because he was losing weight and becoming weak. Complained of frequent urination, loss of memory. The patient had been employed by one of the large periodicals as a political writer on account of his intimate knowledge of politics. For the past six months he was unable to deliver any speeches, and because of his inability to concentrate was unable to write. Physical examination revealed a remarkably well preserved individual, skin ruddy and moist. The radial and temporal arteries only slightly sclerotic; eyes clear and moist; knee jerks absent; venereal history negative; fine tremor of hands present; musculature flabby; weight 210 pounds. The patient consulted me on account of his mental condition, thinking it might be due to diabetes, which was sapping his strength, and causing him loss of sleep. I informed my patient that I did not think it wise to treat the diabetes heroically, as we might upset his metabolic equilibrium, as is often done in elderly diabetic patients when the diet is radically changed. He persisted,

however, in his desire for treatment, and it was administered with reluctance. The injections took place as follows: September 10th, September 25th, October 4th, October 18th, October 27th, November 7th. At this time my patient voiced the opinion that he was feeling ever so much better, and that his memory had greatly improved, so much so that he had written an article for a Washington paper which had been accepted. He then received injections on: November 18th, November 28th, and December 15th. The patient was so much improved mentally that he was busy writing every day; his mentality was that of a man of forty. He was able to express himself in definite terms, and recall past events that had happened in the political world years ago; sleep was undisturbed. He informed me that he did not become fatigued on exertion, either physically or mentally.

During the course of treatment his sugar output remained unchanged, although the polyuria and weakness disappeared. This is a remarkable case in that definite results were produced in a man of this age, as evidenced by a dismissal of all symptoms that might be referable to a final waning of all endocrine functioning.

CASE II.—Young man, aged thirty-four, instrument maker by trade; venereal history negative. A history of diabetes extending back three years. Complained on visiting me of general weakness, loss of weight and ability to concentrate. Sexual instinct at a minimum; erection impossible. Physical examination revealed a prematurely old man. Skin dry with beginning wrinkles; heart and lungs negative.

First injection October 17, 1919, continued for a period of four months at intervals of seven days. There was no dietetic treatment advised, and none indulged in. On discharge, the patient was sugar free, had gained thirty pounds and, as he expressed it, was feeling like a new man. He also gained back the power of erection. His spermatogenic function, which had been absent for two years, returned gradually. His wife became pregnant in May, 1920, seven months after the patient received his first injection, but unfortunately miscarried at the third month. He now enjoys better health than at any time during the past five years, and is doing hard manual work without any appreciable fatigue.

CASE III.—Female, married; no children. Menstruated at the age of fifteen. Periods remained regular until the age of twenty-seven, usually lasting four or five days; no pain. At this time the patient came home one evening to find her cousin dead in bed. Following this shock she swooned, was revived and continued in her usual good health, but did not menstruate. She had suffered from amenorrhea for the past two years, previous to consulting me. Physical examination revealed no obstruction or malposition of the uterus. There was no tenderness over the ovarian area, nor was there any leucorrhœa. Skin was lightly icteric, and drawn in appearance. Frontal headache was complained of. The patient presented an apathetic appearance.

A specimen of the husband's semen examined on a warm stage microscope showed very active spermatozoa. His Wassermann was negative, as was that of his wife. I advised routine injection of my serum. The patient received one injection

weekly for a period of four months. During the middle of the fourth month she menstruated. I visited her the following day, and found that she was losing a normal amount of menstrual blood. The flow continued for two days and subsided. The next period was regular, and they have continued so to the present. This patient had been curetted previous to the administration of the serum, without result. Undoubtedly her ovarian dysfunction was due to the sudden shock she received over two years ago, and as a result her endocrine equilibrium was disturbed and normal stimulus did not take place.

CASE IV.—Male, aged fifty-seven; hatter by trade. History elicited the fact that the patient's skin was becoming dry and rough. The sexual function had been impaired for the past four months, with inability either to ejaculate or maintain erection. The patient was unable, at times, to sleep more than two hours a night. He became uninterested in his work, lost weight and strength, and presented an apathetic appearance. The physical findings were negative throughout, except for a slight hypertrophy of the prostate. There was a definite mental obsession due to anxiety over his condition. After receiving ten injections of the serum the patient had improved greatly and had resumed business. His nights were comfortable, and he felt much improved. Three months after beginning treatment he gained back the power of erection and ejaculation. Microscopical examination of the semen, however, revealed the fact that the spermatozoa were not motile. The psychological stimulus coincident to the return of the function was indeed wonderful in that it changed the mental aspect entirely, allowing him to dispel the pseudoobsession under which he was laboring. This patient is well and working eight hours every day. His mental attitude is cheery, and he looks and acts twenty years younger.

CASE V.—Capitalist, aged fifty-four, past history negative as to medical and surgical illness. Has always indulged in alcohol to excess. History of sexual indiscretion dates back for the past twenty years. Consulted me June, 1919, because of inability to maintain erection, with partial loss of ejaculative powers. This condition had been present for a year. Physical findings negative aside from hypertrophied prostate. Administration of serum commenced June 15, 1919. Received ten injections in all. On discharge function had returned. I may state that there was no medication aside from the serum used in this case. This patient was of the roué type and the condition was the result of fatigue of the endocrine secretion which responded to specific stimulation in the form of activating substances.

In none of these cases was there any evidence of disease of the interstitial cells of Leydig. In each case electric stimulation caused a slight erection of the penile musculature, with a short contraction of the sphincter muscle. The patient in Case II did not react in any way to large doses of strychnine, which lead me to believe that neurological conditions existed. In spite of this fact endocrine stimulation produced results. Last but not least, the

psychological effect produced by the renewing or revitalizing of a dormant function was capable in these five cases of so changing the outlook on life that bodily vigor and mental acuity were substituted for morbid forebodings.

The question of grafting or implanting testes is a satisfactory procedure in the majority of cases, but as sex dysfunction is pluriglandular in its entirety, it is necessary to ascertain the metabolic rate and function quotient of the other secretory glands before operative procedure is advised. In a testicular implant case in which operation was performed some time ago, it was necessary to resort to thyroid feeding after the implantation in order to coordinate the *vis a tergo* of the secretory equilibrium, the patient being myxedematous as well as suffering from hypogonadism.

I am now working with a solution composed of the salts of the blood, the concentration being isotonic with the blood serum, into which the gland of the donor is placed to facilitate its state of resistance, during the interim between removal and implantation. By this method the functioning power of the gland may be kept in a highly nourished state. The spermatogenic function of the testes is not endogenous, but pluriglandular in its sequence. In other words, sex dysfunction, or testicular dysfunction, is hypoadocrinism, rather than hypogonadism.

766 WEST END AVENUE.

CHRISTIAN SCIENCE AND SEX.

BY THEODORE SCHROEDER, M. D.,
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It might be interesting to see if some of the more fundamental doctrines of Christian Science can be explained as the intellectualization of psychoerotic states and attitudes. My own past observation impels me to seek the interpretation of all mystical philosophies of like tendencies in terms of the emotional conflict over sex. Intensified sexual impulses are often accompanied by an equally intense and often inefficient urge to exclude the physiological aspects of sex from consciousness. Thus it often happens that nymphomania or erotomania manifests itself to the rest of the world as erotophobia. When this becomes formulated according to various degrees of intensity and with varying cultural development, we find a great variety of resulting metaphysical theory and theological morality. Let us restate a little of Christian Science doctrine just to see if it lends itself to explanation from this viewpoint; that is, in terms of the internal erotic conflict.

First let us remember that Mrs. Mary Moss-Baker-Glover-Patterson-Eddy had more husbands than she had children. This is some evidence of her having been afflicted by sexuotional conflicts. Without the satisfaction of the biological impulse for progeny, she became afflicted with the compensatory psychological urge to become the "mother" of all who are "born of truth and love" (1). God "is the universal father and mother of man" (2), perhaps because bisexual impulses in

herself required the projection of these dual qualities into her God. She discoursed glibly about "the womanhood as well as the manhood of God" (3). Probably because with this concept she could achieve a needed compensation for her feeling of inferiority, due to her femininity (4). This compensation consisted in identifying herself with God, in the rôle of being his feminine part.

Though differently expressed and perhaps differently theorized about, she yet laid claim to the same perfectionism asserted by Mormons and the free lovers among the Bible Communists of Oneida. Sin is but "an error of mortal mind," and Mrs. Eddy having come to a realizing sense thereof, to her all "evil is unreal" (5). That is to say, all her own "shameful" past had to be pushed out of consciousness; had to be treated as unreal, in order to neutralize her feelings of shame, of inferiority. Of course, one who needed such a psychological remedy for a feeling of depression had to abolish "the erring testimony of mortal sense" so that she could receive into consciousness no evidence of her own sin. She could not commit an unreality which alone is sin. Those who are excessively burdened by the feeling of their own sinful flesh tend to find compensations in rising above the flesh, in identifying themselves with the supernatural generally, or with God. So they argue that God, being the "all in all," one like Mrs. Eddy is herself a part of God, and how could she, a part of God, commit any sin so long as she rejects the "erroneous belief" that "evil is real" (6)? No. She is "no longer obliged to sin" (7). To such persons all is pure, even though to unspiritual vision it may still seem both real and evil. Having herself experienced that "spiritual birth" which "opens to the enraptured understanding" (8) many things, she readily discovered (perhaps with the help of her many husbands) that lust is "always wrong" (9) unless the physiological factors can be excluded from consciousness. Then we can oppose to the "material sense of love" a purely psychological erotism, that is a "spiritual law of love" (10) and "spiritual love" (11) with "spiritual oneness" (12), with God or anyone else in the universe, either dead or alive (13).

Thus, through Christian Science ideals will "the attraction between the sexes be perpetual, bringing sweet changes and renewal." So it can be described if we succeed in excluding from consciousness all the physical sexuality, and enjoy approximately the continuous ebb and flow of ecstasy due to erotomania. Since the "material sense of love" is but an "error of mortal mind" it follows that all erotic love is wholly psychological, that is, spiritual. If it is unceasing, as in extreme erotomania, then we can say that God is love and love is all there is of God. It follows that celibacy is nearer right than marriage (14), because normal marital relations tend to dilute the psychosexual ecstasy. Now generation "rests on no sexual basis" (15). In all climes and times, neurotics have found their way to celestial exaltation, through spiritual connubiality, heavenly bridegrooms, and offspring begotten by ghosts. Mrs. Eddy had experienced the pains of parturition at least once, but under the inhibiting

compulsion of her neurosis she could exclude even that from memory and consciousness, and she may have believed herself to have begotten her child on no sexual basis. The psychiatrist can give her a sympathetic understanding if he cannot agree with her. When the "spiritual creation is discerned and the union of male and female apprehended as in the Apocalypse," (16) then will marriage be abolished. In the meantime those of us who continue to suffer from the error of mortal mind that sex is real and some of its lusts are wholesome will continue to mate on a physical instead of a purely psychoerotic basis. "But to force the consciousness of scientific being before it is understood is impossible." (17) So Mary Moss-Baker-Glover-Patterson-Eddy leaves us, to our physical illusions and refuses to disclose any more of her vagaries on the spiritual process of begetting offspring, which "rests on no sexual basis," perhaps because such exposure might reveal too much of the psychoerotic mystery of bisexual attributes of God in herself.

Eddyism proves the correctness of Father Noyes of the Oneida Community when he concluded that a celibate church is a woman's church. Christian Science with its feminine predisposition to celibacy has seventy-two per cent. of women in its following (18). For many more wholesome women in other churches, a virile pastor and the glorification and sanctification of heterosexuality as expressed in conventional, parsonized marriage constitute the lure. Not so in a church that discredits marriage. Here we should expect to find a haven for the victims of inhibitions against normal heterosexual relations, who wish to make a virtue of their misfortune. Those whose impulses tend toward perversion and inhibition need a compensation and thus find it in the "spiritualization" and glorification of the resultant psychoerotic states, that are alleged to rest on no physical basis.

Here, as always, the development is the same. From some abnormal sex tendencies through sexual allegories to a firm belief that all lust is evil. Hence celibacy, spiritual love, eternity of sex attraction through piety, and finally the overthrow of the reason upon the subject of the mania as shown in the illusions about the spiritual generation of flesh and blood offspring which "rests on no sexual basis." This belief that some day either men or women will beget human offspring without the help of the other sex, is an oft recurring symptom of psychoneurosis. Its most distinguished victim was probably Auguste Comte. (19) Recently I saw a letter from a male physician—not yet confined in an asylum, but asserting that soon men without the aid of women would propagate the human species. So the male homosexual may formulate the logical outcome of his conflict. The late William T. Stead assured me that he had seen (but only with his spiritual eyes of course) children begotten without a fleshly father. Every asylum has its inmates who have sufficiently imperative emotional needs to enable or compel them to create in the objective world what others cannot see there, or to enable or compel them to ignore and deny objective realities that most of the rest of us have to admit the reality of, both in our theories of life as well as by our conduct.

For a few the denial for a part or all of the time, of some or all of the objective realities is made possible by such a relatively complete obsession by the erotic ecstasy that it excludes from consciousness, at least for a time, both its sexual origin and the related objective realities. Under this obsessing erotic ecstasy, the sensations derived from objectives do not register in consciousness, or only so faintly that all seems unreal. "The testimony of mortal sense" is weakened or abolished. As the state of erotic ecstasy approaches continuity with relatively small variations of intensity it is readily formulated in: "the attraction between the sexes is perpetual." But since the physical causes of this attraction are (because of shameful experiences) excluded from consciousness, the material sense of love is also abolished. Yet we are here. If now you unite with our consciousness of existence the theories necessitated by the erotic inhibitions we come logically to the conclusion that human beings can be begotten on some other basis than that of sexual methods of reproduction. For all those who need that sort of theory, I should think it is just the sort of theory they need. Obviously there are many such persons. Hence Christian Science and its popularity. There is one "error of mortal mind" that Mrs. M. M. B. G. P. Eddy did not abolish either in herself or her followers, and that is an adipose belief in dollars as real substance.

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UNDERLYING FACTORS IN GOOD POSTURE.*

BY C. WARD CRAMPTON, M. D.,
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(Concluded from page 816.)

The neck is one of the most important and most neglected regions of the body. The cervical spine holds up the head. It surrounds and protects the spinal cord, which in this locality controls the body processes of circulation, respiration, heat production, and to a great degree digestion and nutrition. Yet these bones are frequently badly adjusted to each other, and frequently the spinal column of the neck sags forward and downward. The debutante's

*Address of Temporary President of the Association of Institutions Giving Normal Instruction in Physical Training delivered at Waldorf-Astoria, New York City, April 10, 1920.

slouch is characteristically weak necked, quite typical of the young girl graduate who has had no physical exercise, no vigorous games, and has received all of her instruction in health from books on anatomy and physiology instead of from daily life.

In the neck are the four great arteries which bring blood to the brain and the big jugular veins through which it is returned from the head. The thyroid gland is saddled across the front of the neck, and this has an exceedingly important function in maintaining the nutrition of the body. Tucked away on either side of the throat, in a fold between the larynx and the lateral neck muscles, are three sympathetic ganglia which have much to do with the circulation and respiration. It will be seen that the neck is an important segment of the human body. Necks are as characteristic as faces, and they tell the story of weakness, power, vitality, illness past and present, and even prophesy illness to come.

That neck which has fine, strong muscular pillars on either side running from the ears down to the junction of clavicle and sternum, and heavy posterior masses of powerful muscle running from the occiput back to the spine and scapula—that neck is, indeed, likely to be surmounted with a head worth while in this generation of high deeds and great events. Few people realize what tremendous value there is in a well muscled neck. It holds the head high. The circulation in the neck itself is improved in all its various important parts, the spine, the cervical central nervous system, the sympathetic ganglia and even the larynx and the esophagus. The high held head puts these various parts in their proper position. The low drooped head falls in upon itself and allows each part to discommode itself and its neighbor. The exercise of the muscles of the neck not only improves the power and tone of the circulation but it also mechanically massages the throat and related parts. Exercise of the cervical muscles will do more to correct a bad condition of the tonsils than anything else except the surgeon's knife. Therefore, for the sake of the high head and of all of the body processes that are affected for good or for ill by the condition of the neck, the muscles of the neck should be strengthened.

Exercise No. 1.—1, Press the chin down on the chest as low and as hard as possible, raising the chest to meet it; 2, Scrape the chin along the neck as closely as possible, making as many double chins as you can; 3, Raise the head, look upward, and press far back; 4, Hold this position, emphasizing it as vigorously as you can. Try to look at the back of your head. In doing this exercise it is important at first not to press too hard with the chin nor to strain too hard in going backward, lest the untrained and anemic muscles become overworked and made sore. This dampens ardor and diminishes determination. Begin by doing the exercise five times, quietly and easily. Increase one or two a day to ten times. The four counts should take four full seconds. This means that it should be done at the rate of fifteen times a minute. Under no circumstances should they be done more quickly, but when one becomes accustomed to the exercises, they should take at least six seconds. There should be three to six seconds between each repetition.

The name of this exercise, neck massage, is very well justified; for there is an alternation of strongest possible compression and stretching of the whole of the neck within physiological limits, and if this exercise did not have the additional effect of strengthening the posterior muscle masses, it would be sufficiently useful for the massage effects alone. When the muscles relax, the head will fall forward, because the greater part of the weight of the head is in front of the spine upon which it rests. These muscles are in constant contraction when the head is held up. They relax when one gets sleepy and begins to nod. The nodding is merely due to the

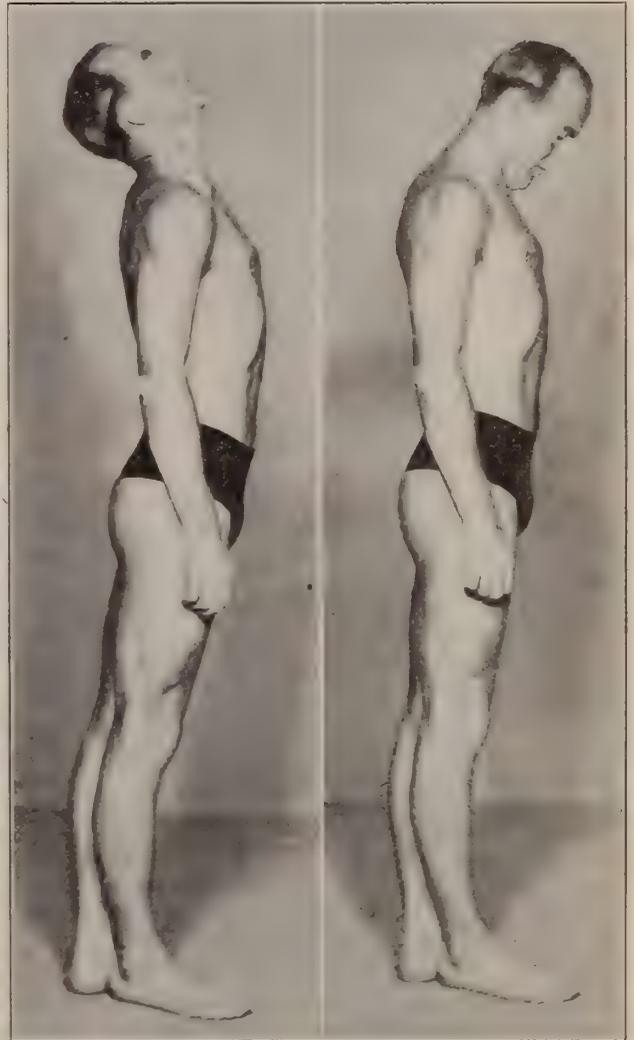


FIG. 4.—Cervical exercise No. 1. Neck massage.

temporary relaxation of these muscles, which are brought back to contraction again when we awake with a start. The extent of the contraction of these muscles is great.

This exercise is unusual in more than one respect. One of its peculiarities is that the fourth count does not change the position but merely emphasizes the position taken on the third count. This is for the specific purpose of shortening the neck muscles and illustrates the application of an important physiological principle frequently used in physical training, as follows: A muscle tends to assume the position it occupies during its work. The operation of the

principle may be seen in the resting position of the fingers of the farm hand or coal heaver who habitually uses a shovel, a pick or some implement which must be grasped and held tightly. This work requires the muscles of the forearm to be kept continually shortened, with the result that during rest

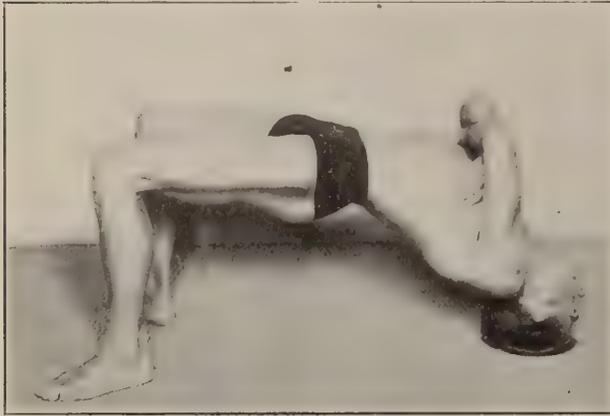


FIG. 8.—Test exercise, "The Bridge"

when the hand is no longer at work, the hand still maintains the position in which it worked, and remains half closed. This is why we emphasize the hard overcontraction of the posterior muscles of the neck, being confidently assured that if we practise it often enough, they will surely tend to remain shortened and the result we desire will be obtained; just as the fingers of the farm laborer are kept bent after their hard work, so the head will be held up. This principle is just becoming recognized as an integral part of physical training and is essential in procedures involving the change of posture relation or position of parts of the body. Other exercises which strengthen the muscles of the neck and should be used diligently, are as follows:

Exercise No. 2.—Position: Raise the arms in a half forward bent position with the wrists rigidly straight, the hands flattened, palms toward the face, thumb at side of index finger, the pads of the index and middle fingers resting lightly upon the chin. The shoulders, arms, forearms and hands are straightened upward and backward. This position in itself straightens the spine and lifts the chest and constitutes an excellent static exercise. 1. Head turning to the right. The head is turned squarely to the right as far as possible, tilted slightly but very slightly backward. 2. Return to position. This exercise should be done both right and left, six to twenty times. It should be noted that the head turns away from the hand and is held well back of it. This is important, for the head should be held back both in position No. 1 and in position No. 2. This is again putting into operation the principle given above in discussion of the first exercise, and one can see why it is necessary to keep the posterior muscles contracted and the head held well back. Keeping the head well back is necessary to keep the muscles of the neck shortened while they are working, and thus to put into operation the principle indicated above.

Exercise No. 3.—Position: Chin resting on right shoulder. Do not lift the right shoulder to the

chin, but use every effort to place the chin down and far back. Do not permit the shoulder to come forward. 1. The head is thrown back and toward the other shoulder in an endeavor to place the back of the head upon it; 2. Return to position. The exercise continues in an alternate endeavor to press the chin on one shoulder and the back of the head upon the other shoulder. It should be done slowly from ten to twelve times on each side. This exercise keeps the posterior muscles of the neck in a contracted or semicontracted state.

The posterior triangle of the neck extends from the ear along the line of the sternocleidomastoid muscle to the top of the sternum and is prominently shown. The base of the triangle extends from the insertion of the muscle of the sternum along the clavicle to the point of the shoulder. The other side of the triangle extends in a line not quite straight from the point of the shoulder upward to the rear. Incidentally the anterior triangle is massaged in a way similar to Exercise 1. These three exercises should be practised daily by every man, woman and child in the United States. The most favorable time is in the early morning on arising, for they form a part of the regular daily morning life-prolonging exercises.

The results of these exercises are as follows: Good posture of the head, good posture of the chest and back, stronger muscles of the neck, improved circulation in the important structures of the cervical regions and a general improvement in the whole body metabolism. The muscles of the neck of every man, woman and child should be strong enough to do the test exercise, the "bridge." The man who can do this has a set of muscles sufficiently strong to hold his head up, and it is perfectly clear that the exercise taken to make the neck muscles strong must have done his whole system a marvelous amount of good. This test should not be attempted within a month from the time of beginning the exercises indicated above, or strained neck will result.

Good posture is a three storied affair. It concerns the head, the chest, and, perhaps most important of all, the abdomen. We have noted the methods of raising the chest by simple static exercises and the great importance of the tone and development of the muscles of the neck in holding the head high and raising the chest. The abdominal features of both good and bad posture are perhaps the most important of all.

ABDOMINAL EXERCISES.

Biologists tell us that the normal attitude of pre-Adamic man was on all fours. This placed the spine and ribs above the abdominal contents, which were suspended from them by strong ligaments, the kidneys snugly attached behind the peritoneum, the intestines hanging like a bunch of grapes from the mesentery, and the liver, stomach, spleen, all with appropriate sustentacular ligaments. Man, on rising from this horizontal position, found his abdominal contents attached to the rear wall of the abdominal cavity, instead of hanging from above.

The liver soon obtained an attachment to the diaphragm, from which it now hangs suspended as it did previously from the posterior abdominal wall. The other organs still retain their posterior attach-

ments. This constitutes a hereditary disharmony, which is constantly causing trouble. The kidneys are prone to leave their moorings and slide down the back, sometimes behind their peritoneal coverings and sometimes pushing the peritoneum in a pouch before them. The small intestines hang down from their attachments and occupy as low a space as possible in the abdomen, flowing down into the pelvis, their weight pressing upon the pelvic contents, i. e., rectum, bladder, and generative organs, the lower layers of this mass of intestines being pressed upon by the weight of the upper layers.

This is bad for the pelvic organs, for they are crowded, congested, and generally discommoded in action, and it is bad also for the intestines themselves. This condition results in constant pressure being exerted upon the abdominal wall from within outward. In the erect position, this outward pressure is greatest at the lower levels of the abdominal walls and decreases gradually as we go upward until the ribs are reached, where the dragging effect of the abdominal contents begins to pull it in, instead of pushing it out. Hence, when the abdomen is weak, the trunk assumes the shape of the ancient leather water bottles which when filled were bulging and round at the bottom, but sloped to a thin neck above. Not only is the upper part of the abdomen drawn in, but the chest itself is dragged down and sinks inward. The weighty liver pulls down the diaphragm, which in turn pulls downward and inward the lower ribs which in turn pull down the upper part of the chest, and the bottle shaped appearance extends from pubis to neck.

This is the picture so frequently presented by the chronic invalid, the man in bad posture, the man who has never taken exercise. This is the effect of gravity, that constant force which constantly drags us down toward the earth. It is a picture of gravity victorious over the strength and vitality of a man, the picture of a man defeated by the forces of Nature. He is still erect, still possessed of a certain amount of vigor and muscular strength, but Nature is dragging him down piecemeal and has proceeded a long way toward the winning of the ever waging tug of war, which finally and inevitably she must win, for gravity brings us all at last to rest.

GOOD TONE.

The strong abdomen is a flat abdomen; therefore, make it flat and keep it flat. All that is necessary in the normal individual is merely an effort of the will, calling upon the abdominal muscles to contract. As a rule, however, men are not normal, and the abdominal muscles are incompletely under the control of the will, and in many cases are half paralyzed. For ninety-nine per cent. of the people it is necessary to reeducate as well as to strengthen these muscles.

ABDOMINAL CONTRACTION AND RELAXATION.

Exercise 1.—Position: Leaning forward with the hands on the knees, which are slightly bent. 1. Contract the abdomen, pulling it in and up as far as possible. 2. Relax the abdomen, allowing it to fall down under the pressure of the abdominal con-

tents; one count to the second; two seconds to the exercise. Repeat ten to thirty times.

ABDOMINAL CONTRACTION WITH BREATHING.

Exercise 2.—Position: Hands on the knees the same as in No. 1. Count 1. Abdominal contraction, the same as in Exercise 1; Count 2. Breathe in (abdomen contracted); Count 3. Breathe out (abdomen remains contracted); Count 4. Breathe in (abdomen remains contracted); Count 5. Breathe out (abdomen remains contracted); Count 6. Breathe in (abdomen remains contracted); Count 7. Breathe out (abdomen remains contracted); Count 8. Breathe in. (Abdomen remains contracted. Keep it contracted). Two seconds to each count; sixteen seconds to the exercise. Repeat six to twelve times.

These are probably the best of all the abdominal exercises and are the results of many years of patient research and experience. The first exercise gives a training in the voluntary control of the abdominal muscles, improving their circulation and strengthening them. It forces the abdominal contents up into the upper part of the abdomen, decreases the circumference of the lower segment and increases the circumference of the upper segment. In a well trained athlete, this is readily seen. *Chest expansion is important, but abdominal contraction is a far more significant measure of vital power.*

The relaxation of the abdominal walls permits the viscera to fall again, the alternating contraction

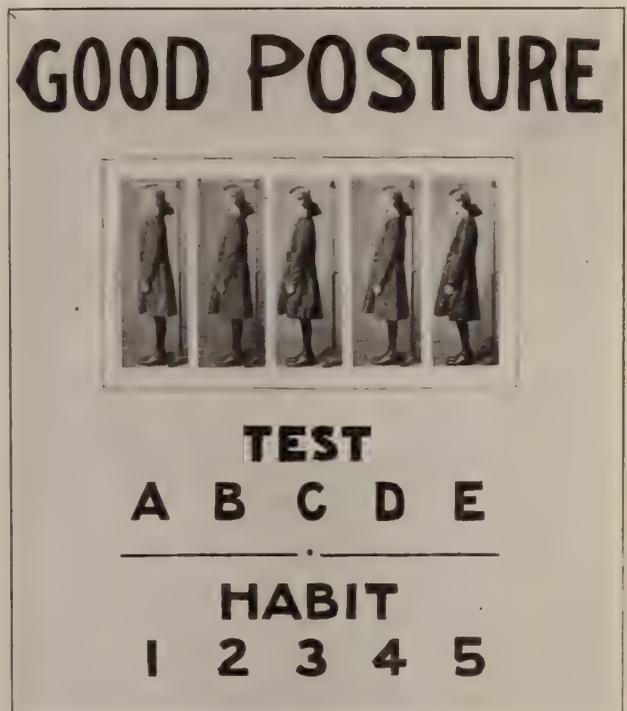


FIG. 6.—Posture chart for schoolroom.

and relaxation causes a churning kind of massage which stimulates the living tissues which form the abdominal contents, heightening their activity. The muscular structure of the bowels becomes less lax and more active, the glandular lining of the intestines, the actuating nervous ganglia, the arteries, veins, and lymphatics receive their appropriate

mechanical stimulation, all of which is conducive to health.

If the diet is even approximately near the biological normal, and the condition has not lasted long enough for the intestinal muscles to become semi-paralyzed or spastic, this exercise will completely relieve intestinal stasis. The improvement which this makes in the taut and strengthened abdominal wall gives it sufficient power to support the abdominal contents. Such power is tested, practised, and improved by Exercise 2. This exercise, breathing with a contracted abdomen, simulates the normal tonic condition of good posture. The abdomen is first contracted and held taut while the breath is taken in and allowed to go out of the lungs. This is the state of affairs which should obtain at all times during the day when a man sits or stands erect, particularly when he is standing still.

In the first exercise, the lower and inner wall of the abdomen was acted upon. In the second exercise, it is held normally contracted while it is put under a rhythmical strain by the movements of the upper part of the chest. It remains in static contraction, which is exactly the position in which it must remain during daily life. These two exercises are given in a position in which the trunk is nearly horizontal, a return to Nature, with a simulation of the natural mechanical strains on the trunk and abdomen.

THE MEASUREMENT OF POSTURE.

The measurement of the posture of children in school should be made as simple as possible. It should be based upon sound scientific principles but it should be relieved from the necessity of painful accuracy of scientific method. All measurements of posture whether scientific or merely practical should be based upon the recognition of the fact that good posture is an evidence of good gravity resistance, for bad posture is on the other hand a submission to gravity. If the child is standing as tall as it is possible for his physical frame to stand, he is in good posture. If gravity pulls him down an inch or two or three, he is in correspondingly bad posture.

Bad posture may be, therefore, measured by decrease in height. This may be shown by actual measurement of height or by observation of the contour of the body in profile for a poor posture will show various displacements forward and backward. If, for example, we take a piece of wire thirty-six inches long and lay it upon a yard stick in a vertical position, it will, if the wire is perfectly straight, measure just thirty-six inches. Now let us take this wire and bend it slightly at the middle and call this the position of hips forward. Bend it also at twenty-four inches from the ground making an increased dorsal curve. Bend it again farther up, corresponding to the "head forward" position, and then lay it alongside the yard stick and we will see that the wire, although it is thirty-six inches long, only measures thirty-two or thirty-three or possibly thirty-one inches, depending upon how much we have bent it at the various points corresponding to the hip, back and neck. This then is the way to measure how bad posture is.

Other measures of posture may be obtained by

noting actual visceral ptosis, i. e., the depression of internal organs below their normal positions. If the abdomen bulges and the chest is flat, there is bad posture and visceral ptosis.

We should be able to arrive at an index of comparative girths of chests and abdomens. In a healthy young man the average chest girth should be from twenty-five to forty per cent. greater than the smallest abdominal girth; in woman it might be less. The proportions of five to four are approximately normal. This measurement is complicated by the amount of abdominal fat and other factors. Circulatory ptosis can be determined by the author's test, which is based upon an observation of the systolic pressure and heart rate in the horizontal and vertical positions.

For the school room, however, we wish to measure posture merely to stimulate improvement. For this purpose there is offered a chart showing successive photographs of the same individual ranging from perfect posture to very poor posture. This indicates that a child may have excellent, very good, fair, poor or bad posture, that it is possible for any child to be either good or bad in this regard. It is evidence on the one hand that good posture is not impossible for any one if effort and application are brought to bear and, on the other hand, it is evidence that those who have good posture may if they are not careful tend to lose it.

In this respect, an important distinction must be made. Many children can assume good posture during a posture test, but make no effort to keep good posture at any other time. Hitherto they have been placed in the good posture division, but they deserve this distinction far less than the B posture children who try very hard all the time. I strongly recommend that good posture tests should be continued in a standard fashion, i. e., while standing, marching and exercising, but that in addition a rating should be given for habitual posture, and I suggest the following set of instructions for the teacher:

THE POSTURE RATING.

1. The teacher should be provided with posture charts showing a child appropriate in size to her grade showing the five posture positions.

2. She will conduct a test in posture, including standing, marching, and exercising with half of the class acting as assistant judges while the other half is being tested.

3. The pupils will be graded on this test with the letters A, B, C, and D corresponding to the pictures on the chart.

4. The teacher will observe the posture habit of pupils in their daily work, particularly upon standing for recitation of lessons, writing at the blackboard, marching to assembly, and, in short, rate the pupils on their habitual posture.

It is preferable to have one or more posture monitors selected because of their superiority in physical training and in good posture, and it should be his or her duty to record the ratings and relieve the teacher of the time and trouble rather than to nag and browbeat their fellow pupils, as monitors are sometimes prone to do.

The rating for habit in posture should be in nu-

merals, 1, 2, 3, 4, and 5, referring to the values exhibited on the chart. Thus we will have each pupil rated by letter and by number very much as business organizations are rated in financial reports. A will stand for the best posture on test, but the pupil in order to get in A 1 must stand in good posture all of the time, otherwise if he slumps he may get a rating of A 2 or even A 4, or A 5. A pupil in C posture may be C 4, or C 5, depending upon his posture habit. It is theoretically possible for a pupil in C posture to be 2, or even 1, on habit, because some pupils during the test have an inconquerable tendency to assume rigid overstraightened posture, which cannot be rated perfect; but when they are unconscious of observation sit and stand perfectly. Pupils and teachers alike take quickly and easily to these ratings, for A 1 has a well understood significance the world over and all departures from it have a common meaning.

CARDIAC MANIFESTATIONS IN INFLUENZA.

BY CHARLES GREENE CUMSTON, M. D.,
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Although some attention has been given in the past in France, England, and the United States, to the cardiac manifestations of influenza, it is probable that the most important work on the question has been done by that veteran clinician, Professor Eichhorst, of Zurich, and his school. We know at present that during the evolution of influenza some one or all of the structures of the heart or its elements of innervation may become involved, the endocardium, the pericardium, or the myocardium, and this means that there exists a vast variety of symptoms, according to the cardiac structures involved. Cardiac influenza, therefore, may manifest itself as an endocarditis, pericarditis, or myocarditis, likewise by disturbances of nervous origin, such as syncope, bradycardia, tachycardia, or arrhythmia. It is also probable that these influenzal lesions are far more frequent than is generally supposed or as given in the classic textbooks on medicine, and if the disturbances in cardiac contraction are compared with organic lesions it becomes evident that their frequency is about equal, although Eichhorst maintains that the innervation system is more frequently involved than the histological structures of the heart itself. Sex or age appear to play no part as the bulbocardiac accidents have been met with in infants as well as in the aged, but I would point out that the majority of recorded cases have been encountered in subjects varying in age from twenty to forty-five years.

It also appears probable that hearts already the seat of lesions, the result of previous infections, become more readily the prey of the virus of influenza than normal hearts, and the grippe may likewise either awaken old lesions into activity or create new ones in a neighboring valve; it also attacks the system of cardiac innervation, destroys the cardiac equilibrium, and forces the condition of affairs toward a systolia. It must be frankly admitted that the causative factor of the cardiac pro-

cesses is unknown, although bacteriological research work has occasionally revealed the agents of secondary infection, such as Pfeiffer's bacillus, the pneumococcus, or the streptococcus. But just as frequently no bacterium has been found, in which case the lesions can only be explained by the action of a filtrating virus, which Prof. Bard, of Geneva, and others regard as the probable agent of influenza, or by the action of a toxin acting indirectly as in the case of diphtheria.

The symptomatology of the cardiac manifestations of influenza will depend upon the variety or type of the cardiac involvement, but often in the same subject a combination of several types of symptomatology may exist. One of the tissues composing the heart's walls can never be morbidly involved without reacting upon other component structures so that a series of general symptoms must inevitably result which are found in all cases.

The onset of the symptoms may be very sudden, a syncope, a paroxysm of angina pectoris, or dyspnea revealing the influenzal attack. But frequently these startling accidents only arise some days after the onset of the disease, or occasionally during convalescence when all danger is supposed to have been passed. Huchard insisted upon this latent period—which may be long—between the influenzal infection and the onset of the first cardiac manifestations.

But all forms of influenzal heart do not offer this sudden onset; the lesions develop quietly and it is only by mere chance that an examination or the development of serious complications, such as embolus or asystolia, reveals them. Among the more constant subjective symptoms should be mentioned a severe acute pain in the cardiac area or a sensation of cold or crushing in the retrosternal region, extending to the neck and arm. The asthenia and prostration are very evident in this clinical form of influenza, while the suddenness of their onset is rather characteristic. The dyspnea is intense and cannot be explained by the slight pulmonary lesions found on auscultation. It is accompanied by cyanosis, algidity and peripheral coldness. Hypotension is constant and very marked. The weak, small pulse is very unstable; arrhythmia is frequent. The evolution of the process varies and occasionally all morbid manifestations subside without leaving any trace, or the subject recovers with a well compensated valvular lesion and this is perhaps the most common occurrence in practice. On the contrary, in other instances the process becomes aggravated and the patient dies either from asystolia or collapse.

In referring to the syndromes that are commonly met with in practice it may be well to follow Eichhorst's division as follows: The pericarditic syndrome, the endocarditic syndrome, and the myocarditic syndrome, as well as some special forms which have been recently described by Minet and Legrand, of Lille, under the name of grippal bradycardiac heart, grippal tachycardiac heart, grippal arrhythmic heart, and grippal cynopal and neuralgic heart. The pericarditic syndrome offers two principal forms, namely, dry pericarditis and pericarditis with effusion. There is nothing which can

help the physician to distinguish these influenzal pericarditides from the same morbid process encountered in other infectious diseases. A fibrinous deposit arises on the serous membrane, giving rise to the friction sound, or the pericardial sac may be distended by a serous or purulent collection. The latter may reach a considerable amount, and the late Professor Grasset, of Montpellier, had a case under his care in which the amount of fluid was seven hundred cubic centimetres. A fact to be noted is that in this syndrome the myocardium is very frequently simultaneously involved.

The principal symptoms that may be encountered are the intensity of the general phenomena, the oppression, distress, increase of the area of cardiac dullness, the smallness of the pulse, the weakness of the heart sounds, and the presence of friction sounds, symptoms common to all types of pericarditis. The outcome of the process is often fatal, particularly when a fluid collection develops.

Among the cardiac manifestations accompanied by an organic lesion, the endocarditic syndrome is by far the most commonly met with in practice, and generally makes itself evident during the progress of the influenza or at the time of convalescence, and in the latter case it would seem to assume a much more serious aspect since all the valves may become involved. Nevertheless, influenza is more prone to attack the left heart, attacking both valves with about the same frequency and occasionally becoming located on both at the same time. However, cases have been recorded in which lesions developed on the tricuspid and even on the valves of the pulmonary artery. The morbid process may also involve the parietal endocardium or invade the intima of the large vessels.

From the viewpoint of pathology, the ulcerating and vegetating types of endocarditis have been found to be about equally frequent. The onset of the process is ordinarily silent, but frequently there is a recrudescence of the general phenomena, the dyspnea and tachycardia attracting the clinician's attention to the heart. The temperature chart assumes the pyemic character, the percussion dullness of the cardiac area increases, infarcts may occur and the pulse is poor in equality. The diagnosis will, however, be made by the detection of a soufflé, and in influenzal cardiac phenomena the soufflés possess two distinctive characters, namely, roughness and an early onset. They are fully developed in a few days and it is not at all uncommon to find them within four or five days after the recrudescence of the general phenomena. Such cases of endocarditis are serious when not fatal and when death does not ensue a serious lesion of the valves remains. The lesions are never limited to the endocardium alone, and are invariably accompanied by a process in the pericardium and myocardium.

Perhaps more than in the two preceding forms, the word syndrome should be employed for the clinical disturbances originating from the myocardium. In point of fact this syndrome includes a great number of most varied phenomena which point to an undoubted disturbance of the cardiac contractions. Nevertheless, this disturbance is not of necessity dependent upon an anatomical lesion of

the muscle, so that the term myocarditic syndrome is to be preferred to that of influenzal myocarditis. Eichhorst maintains that he has never observed myocardic lesions, even microscopic. But for all that myocarditis exists and lesions of the muscle have been frequently found at necropsy, but they are often hidden by a coexisting endopericarditis. It would seem that this pathological involvement of the cardiac muscle has a predilection for hearts which have been attacked by an antecedent infection. The lesions found are those of acute myocarditis.

The clinical signs are classical: precordial pain and a weak, small and irregular pulse. The arrhythmia is important to detect, as well as a special "trotting sound" described by Huchard, found by auscultation. This consists of a three time rhythm, the result of a systolic effort which takes place between the two principal times. It should be mentioned that the myocarditis may undergo its evolution silently, and it is only upon the occurrence of an effort that syncope arises, which may be fatal, and gives an indication of the true state of affairs. The accidents which will now be referred to as special syndromes, combined with those given above, will allow the clinician to come to a correct diagnosis.

The influenzal bradycardiac heart has been known for some time and is looked upon as frequent, although some maintain the contrary to be true. It may appear at various periods of the influenza, sometimes at the onset and in other cases it may develop during the progress or at the end of the disease, or even during convalescence. Should it be continued it usually presents a paroxysmal character, in which case it may bring about serious disturbances. The lowest pulse rate averages from forty to fifty beats, but it has been known to be as slow as nineteen or even fifteen beats to the minute. These disturbances of the heart contraction are accompanied by asthenia and intense prostration which may persist for a long time after the patient has recovered. Although some of these disturbances rapidly subside, there are others that persist for some time, as much as a year or fifteen months after recovery from the influenza. However, the bradycardia is not often fatal *per se*.

Influenzal tachycardia is considered frequent by some, while Eichhorst maintains that it is uncommon, and others uphold this view. The time of its onset varies; it may be very early in the disease or not arise until defervescence or convalescence have taken place, and this a very long time after the acute accidents have disappeared. Usually intermittent, it may be continued, the beats averaging from one hundred and twenty to one hundred and forty a minute. These attacks are accompanied by thoracic pains, distress, and stasis in the pulmonary circulation. Instances have been recorded in which paroxysms occurred which brought the pulse rate as high as three hundred beats a minute.

The evolution of this clinical form is essentially variable. The tachycardia may suddenly subside after a more severe paroxysm than the previous ones, or it may persist for a long time after recovery from influenza, as much as eight months in a case recorded by Sansom. The prognosis is serious in all cases and a fatal outcome is not uncom-

mon. The coexistence of phenomena similar to those encountered in Basedow's disease is not infrequently observed with postinfluenzal tachycardia, to which the name of vagus storms has been given.

The arrhythmic influenzal heart is another form, designated by Eichhorst as influenzal extrasystolic heart. Some English observers maintain that there is no relationship between the cardiac disturbance and the subjective sensations experienced by the patient. A severe arrhythmia may not be accompanied by any subjective symptom, while a very mild form can very well be accompanied by serious accidents of precordial distress. The arrhythmia may be bigeminate, trigeminate, alternating, or complete. The characteristic unstableness of the influenzal pulse is here to be found in its highest degree. The numerous extrasystoles which characterize this form appear during the same phases of the disease as the bradycardia. The process undergoes an evolution toward recovery or to chronic myocarditis and asystolia.

The syncopal heart of influenza is rather more of an important symptom than a clinical entity and in reality indicates a profound disturbance of the heart's contraction. It appears at times as an initial symptom announcing the onset not only of the cardiac complications, but of the causal infection as well. At others it is a complication of convalescence, or as a frequently fatal accident arising during the evolution of some other form of influenzal heart. It occasionally completely occupies the clinical picture on account of its repetition and with the instability of the pulse, presents the only sign of the cardiopathy present. The prognosis is invariably extremely serious.

Influenzal cardiac neuralgia has been known for years and many instances have been recorded in the Anglo-Saxon medical press, but Eichhorst, on the contrary, regards it as of extreme rarity and only to be encountered in young people. It would seem that this opinion of the eminent professor of Zurich is exaggerated because if one regards it as a mere symptom, it will be found noted in nearly all cases recorded. Often early in its onset, the pain appears with the beginning of the cardiac accidents. It is a violent, sharp pain, a crushing sensation or one of torsion at the anterior portion of the sternum, shooting to the back, neck, shoulder and arm. It is prone to occur in paroxysms, its evolution in some cases being in the form of a series of neuralgic crises. It also may arise very late in convalescence. Usually benign, it has been known to cause death in a few instances. Huchard was of the opinion that these cases are often instances of old angina pectoris, aggravated by influenza.

As to the pathogenesis, so far as the endomyopericarditic lesions are concerned, the lesions met with at necropsy show unquestionably that it is in the heart itself that the cause of the clinical signs met with are to be found. In those instances where no lesions can be discovered at necropsy, Huchard explained them by a cardioplegia resulting from involvement of the pneumogastric nerve as well as by an involvement of the motor centres of the heart in the bulb. Cardiac influenza is a bulbar process; alone, the arrhythmia is the result of a morbid

change in the muscle fibre. Huchard also attributed an important part to an influenzal coronary endocarditis which remains latent for a long time until one fine day it sets up a degeneration of the myocardium. Other observers believe that there is an irritative lesion of the accelerator nerve of the heart in cases of tachycardia and a neuritis of the vagus in cases of bradycardia. It has also been maintained that there is a possible action from thyroid hypersecretion on account of the phenomena of basedowism sometimes met with. As to the pain, it has been attributed to an involvement of the ganglions of the cardiac plexus or to a phenomenon similar to visceral neuralgia.

Althaus is of the opinion that there is a neuritis of the vagus and also a lesion of the bulbar centres, but given our present knowledge of cardiac anatomy and physiology, other explanations may be put forward. The bundle of His and the various cardiac ganglions, the relation existing between the ganglions and their motor and regulating action over the movements of the heart, might very properly lead one to suppose that there may be a single pathogenesis for all cardiac influenzal processes.

If the infection involves the heart *en masse*, then we will have the classical forms of acute myocarditis, endocarditis or pericarditis. But let us suppose that there is a milder action of the infective matter, which attacks only the more noble elements of the heart, either the ganglions and conducting fasciculi, automotors of cardiac contraction, or the neuromuscular cells scattered throughout the cardiac muscle and which, when irritated, may be the starting point of cardiac contractions which are extrasystolic in nature. If the toxin acts on the former of these elements an arrest will take place in the conduction of the excitations, the ventricles will have a tendency to take on their own rhythm and the result is a bradycardia.

Now, let us suppose that the infection produces very small isolated areas of myocarditis in the midst of the muscle; these can be the starting point of extrasystoles which, according to their frequency, will give rise to either arrhythmia or tachycardia. All of these accidents of influenzal cardiac processes can be explained, either by a massive action of the influenzal toxin on the heart or by a milder action acting upon more differentiated elements. This is merely an hypothesis. On the other hand, the symptoms common to all forms of influenza with cardiac manifestations, viz: hypotension, unstable pulse, asthenia, collapse, prostration and sudden death, represent the clinical picture of suprarenal insufficiency. In certain infectious diseases—diphtheria for example—myocardic syndromes are occasionally observed which may be due to an acute suprarenal insufficiency, and it seems rational to suppose that the toxin of influenza may act in the same way in this respect as that of diphtheria. The cases of basedowism observed in influenza would seem to support this view.

I believe that in this brief summary I have covered the subject of influenzal cardiac complications sufficiently to give the present views held on the subject in France and Switzerland and need merely add that the prognosis in all cases is serious.

Editorial Notes and Comments

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ESTIMATING EMOTIONS.

The doorways of Man's existence have been thrown wide open. He is as neatly exposed as a child's doll's house with the front off. Doctors, surgeons, alienists, theologians, psychoanalysts, lawyers, philosophers, have crowded in and left no room unexamined, and no theory concerning it unwritten. They pursue the owner to his bedroom to steal and analyze his dreams, they describe his wilful waste in kinetics as he gets into his clothes, and his repressed emotion, finding an oathly outlet as he struggles with hyperstarched buttonholes. In vain he protests, they solemnly produce cards and file a list of his every possession with brain racking charts showing horrible probabilities because he has forgotten how to solve simple tests which his kindergarten progeny regard as a very small matter. In fact there is a report that British working men are attending evening schools so as to keep up to their children and not be shamed by them. An industrial commission set out recently to ascertain whether employees' thoughts were on their work while they were employed. About only two per cent. were. One woman said she was "thinking of nothing," a deceptive statement, because the commission declared this an impossibility and commissioners are always right! Now comes along Dr. Waller, director of the laboratory in the London University, who puts you in a chair, fixes up an electric apparatus which includes a pair of electrodes, a Wheatstone bridge and a galvanometer. Opposite the patient is a strip of linen bearing measurements. The in-

ventor asserts that it will throw a new light upon many important physiological and psychological problems, for a doctor can understand his patient's temperament with its help as the betraying beam of light traces its way accusingly across the record. The spoken word may be controlled and looks disguised, but few can control the sudden ceding of the mind to an emotion, not even a Scotsman or a Red Indian. Dr. Waller hopes in time to make the instrument record will power. At present he admits its limitations. Hatred or love may produce an equal wave of emotion, also the hearing of a crime or being accused of it; dread of pain or efforts to endure it.

What's done we partly may compute,
We know not what's resisted.

A doctor does not generally require any electric device to ascertain emotionalism, for those who come are usually somewhat unbalanced by disease and the flushed face, nervous fumbling with articles of attire, shifting of position and uncertain replies give him as much information as he requires. For ordinary use we do not need—indeed, had better not learn what our acquaintances are thinking. The profane sailor, who resolved to give up swearing at his mates, used to say: "God bless you; you know what I mean." It may be that the recording light beam would have been slightly modified even by the more temperate form of expression as it indicated a slightly disciplined emotion.

THE PROGRESS OF INDUSTRIAL MEDICINE.

Industrial medicine is making great headway and more so in America than in any other country. Most of the large industrial concerns here have their medical staffs, their hospitals, convalescent homes and so on. It has been found to be true economy and quite as much in the interest of employer as of employee, to keep the latter in good health and to afford him or her competent medical or surgical attendance when sick or injured.

While the practice of industrial medicine of the future will be more and more in the nature of prevention, there will still be plenty of scope for the practice of curative and healing medicine. In industrial businesses there will always be ample opportunities for the practice of the surgeon's art. The injuries and sickness brought about by industrial work more than rival similar disabilities produced by war. There is a machine shock resulting in neurasthenia and nervous breakdown as well as shell shock of war occasioning like affections. In fact, most of

the injuries and illnesses produced by war can be duplicated in industrial civil life. Recently, in Great Britain, a good deal of work was done in this direction. A medical research council and department of scientific and industrial research have been formed, the annual report of which has been issued recently. The investigations of this body are of great interest and have borne good fruit. The latest development of this kind, however, is contained in an appeal which St. Mary's Hospital Medical School, London, has issued asking the heads of industry to endow a Chair of Industrial Medicine. The holder's duty would be to visit heads of great industries throughout Great Britain and to find out from them what special diseases are leading to the loss of working hours. He would investigate the effect of fatigue on workers and their efficiency and also all trade diseases. Further, he would be responsible for the instruction of students in this branch of medicine. It is hoped in this way to provide a service of doctors thoroughly conversant with industrial health problems. It has been shown already what can be done in this field by the work of Dr. Lister Llewellyn on miners' nystagmus. The causation of a disorder which is costing Great Britain five million dollars a year, according to a recent estimate, has been discovered by this physician.

In the last years of the war a quarter of all casualties were gassed men; that is the number of men gassed in the British Army ran into six figures. For several months nearly ninety per cent. of these patients that came to the base were evacuated to England. It became obvious that if the war were to be won by the Allies that this loss must stop. The matter was grappled with in earnest, and a hospital at Boulogne was set aside to discover a means of checking the wastage. In a short time eighty-seven per cent. of all gassed men coming to the base marched half a mile in their equipment to convalescent depots within a month of their gassing, and the percentage evacuated to England from one hospital dwindled from nearly ninety per cent. to two per cent. Wastage of a similar nature occurs in the labor world. Every year sick workers lose wages amounting to millions of pounds, and they become a charge on the State for treatment and insurance amounting to millions more.

The object of the appeal of St. Mary's Hospital is to deal with this problem as the war hospital at Boulogne dealt with gas casualties. It is only necessary that first class men be afforded the facilities that exist in medical schools for investigating these problems. The trend of the practice of medicine is changing, and medical students of the present day must be so trained that they will be able to adapt themselves to the altered conditions.

PHYSICIAN-AUTHORS: DR. SILAS WEIR MITCHELL.

There are two ways of classifying Dr. Silas Weir Mitchell—the most celebrated Philadelphian since Benjamin Franklin—for he attained international distinction in two widely separated lines. It is purely a matter of choice whether you call him an eminent physician who was also a prominent author or a prominent author who was also an eminent physician. Mitchell was, in fact, a master mind in several distinct circles of intellectual activity. In literature he was not only a novelist of the first rank but also a poet of high distinction, and in medicine, although his specialty was neurology, he also was a recognized authority on toxicology (particularly snake poisons) and his researches on the reflexes of the lower limbs were the most comprehensive made in this country. On these and other medical subjects in which he conducted elaborate experiments and made exhaustive research, he wrote more than one hundred and fifty monographs, many of which are still the last word of authority in the medical profession. Medical work was distinctly Dr. Mitchell's chief life work, though one might be inclined to doubt it after a glance at the long list of volumes of poetry and fiction which bear his name. There are thirty-five of these and practically all were written in the last thirty-five years of his life, after he had turned the age of fifty. Few writers who begin at twenty are more fruitful.

Dr. Mitchell always gave first importance to his medical duties and never let literary work interfere with his practice and research. At a reception in his honor at the University Club in Philadelphia he once said that if he had to choose between literature and medicine he would abandon literature. "If I could be remembered for but one thing," he said, "I would rather it would be for the work I've been able to do for my fellowmen in the practice of medicine." Practically all of his writing was done during his summer vacation period. It was his custom in June to go to Canada for a month of salmon fishing and camping, after which he went to his summer home at Bar Harbor, Me., to devote himself to writing during the remainder of the summer. His contention was that the best rest is acquired by a change of work.

It was as the author of *Hugh Wynne, Free Quaker*—called by many critics the "best historical novel of the American Revolution ever written"—that Dr. Mitchell is best known. *Hugh Wynne* is a faithful picture of Philadelphia life during the War of Independence and many of the characters in it are historic personages. One of these is George Washington. The rise and fall of Benedict Arnold is a

tragic element in the story and the chapter on the death of Major Andre is a classic bit of writing. *Hugh Wynne* was the first of a series of novels from the pen of Mitchell dealing with various periods in American history. *In War Time* also dealt with the Revolutionary period and *The Red City* portrays life during the second administration of Washington as President, with Philadelphia as the background. *The Youth of Washington* was, of course, pre-Revolutionary, and is told in the form of an autobiography. *Roland Blake* and *Westways* are Civil War novels. Many of Dr. Mitchell's short stories had Revolutionary and Civil War settings. Throughout the latter conflict he served as an army surgeon and was in charge of the military hospital at Philadelphia.

Mitchell's other novels dealt mainly with contemporary American life, with the notable exception of *The Adventures of François*, a lively story of the French Revolution which paralleled *Hugh Wynne* in popularity. *François* is the only one of Dr. Mitchell's novels in a foreign setting, but several of his dramatic poems have backgrounds in other countries, or at sea. *The Cup of Youth* deals with Galileo, the astronomer and philosopher; *Philip Vernon* is a metrical tale of the Elizabethan period and *Francis Drake* recounts in verse an episode in the life of that well known seafaring man. All of Dr. Mitchell's novels, whether historical or not, were strongly psychological, and this applies to his poetry as well. He was particularly successful in the portraiture of women characters and through his writings can be noticed the strong influence which the medical profession exerted. To a greater or less extent nearly all his stories are pathological portraitures with plots based on episodes from his life as a practitioner. There are physicians as characters in practically all his novels and in *Dr. North and His Friends*, *The Autobiography of a Quack*, and others, physicians and their experiences and problems are the chief motifs. His first story—aside from a few juveniles written in the sixties—was *The Case of George Dedlow*, which appeared in the *Atlantic Monthly*, when that publication was under the editorship of Edward Everett Hale. It described a case in what he called the Stump Hospital of a man who had lost his legs and arms, and it undertook to diagnose the effect of this on the man's individuality. So realistically written was this fragment that the public supposed George Dedlow to be a genuine case, the newspapers took it up and subscriptions began to pour in.

But it was not the entertaining pathological information which made Dr. Mitchell's writings popular. His popularity was due to his imaginative virility,

his deep comprehension of human nature and human thought, his fascinating analyses of character and the fact that he always had a good story to tell and knew how to tell it. Although he never was a best seller (except in the cases of *Hugh Wynne* and *François*) his books still have a steady sale and more than a million copies have been sold.

Dr. Mitchell was born in Philadelphia on February 15, 1829, and died there on January 4, 1914, of influenza, after six days' illness, at the age of eighty-four. He derived his medical and literary gifts from his father, Dr. John Kearsley Mitchell, who was for several years a professor in Jefferson Medical College and was a poet of note. It was in Jefferson Medical College that the son obtained his medical degree in 1850. He also studied at the University of Pennsylvania. In 1887 he was president of the Association of American Physicians and in 1908-9 was president of the American Neurological Association. His eminence in science and letters was recognized by universities and societies all over the world which conferred degrees and honors upon him.

FREE ASSOCIATION AND ITS RIGHT TO USE.

The use of free association in psychoanalytical therapy meets with familiar forms of criticism. There are some who boast an intellectual modesty, which has, however, a stale odor of intellectual and moral laziness. To them any feature of the psychology of the unconscious seems too deep, too obscure. Others, with a more openly acknowledged superciliousness, consider the seemingly random memories brought into view by free association too trivial for serious technical attention. Would it aid in obtaining a truer valuation of the patient's free associations and of the method which deliberately makes use of them, if a psychological appraisal could be found for both classes outside of psychoanalysis? Perhaps such an estimate would also throw light where the employment of such apparent vagaries of memory seems too obscure a procedure. Bergson never laid claim to being a psychoanalyst. The matter of his *Mind-Energy* was written or spoken independently of the teachings of Freud. He has a fondness, nevertheless, for delving into psychic facts and a keen sense of the practical implication of psychic actualities in each moment of life.

Bergson has already made classic the statement that the function of the past, stored in memory, is to illumine the present moment, to direct and further the action in hand. The task of mental therapy is surely the freeing of memory to such service, memory that has been too long held back—repressed.

In order to release energy at such a point, energy painfully caught and held in the repressed matter, is it effective to turn upon the situation the logic of intellect? Is any patient ever reasoned out of an incessantly haunting obsession, compulsion, phobia?

Bergson suggests a different sort of light. He says that memories are recalled "in order that the circumstances which have preceded, accompanied, and followed the past situation, should throw some light on the present situation and indicate the way out of it." Bergson is talking of memories which flood upon a new perception but it is not amiss to apply his appreciation of the service of memories to such a particular point, the blocked up issue which has appeared like a new perception in a dream phenomenon or a stubbornly unchangeable one in a symptom.

This philosopher-psychologist at any rate finds room in theory and practice for a thinking process which reaches in two opposite directions, and counts each of equal dignity. Thought forms and follows a directed scheme but this is meaningless, yes impossible, unless there is "a descent of the scheme toward the image, and a moving of the mind among the images themselves."

A careful reading of Bergson's chapter on Intellectual Effort convinces the reader that to this thinker at least all intellection makes use continually of the method of free association. There is no word either of exclusion on the ground of triviality or any other quality. The only criterion of selection is serviceableness to the matter in hand.

LET THERE BE LIGHT.

We are ceasing to regard fresh air with suspicion. It is no longer regarded as poisonous after sunset or dangerous if encountered as a draught. We have even a Fresh Air Fund, out of door sleeping places, and now a big campaign is going on to get light. Not bursts of light as on the Fourth of July, not like illumined Broadways, not glaring ballrooms, but steady light for workers, without glare, without flickering.

Eyestrain means headache, and headache has a hundred little devils called minor ailments dancing in attendance. Strained eyesight means that the pretty eyes of our girls are hideously bespectacled; strained eyesight in youth means almost sightless old age and no occupation which accentuates the dreariness of the long days. So now there is cropping up in every city long titled municipal bodies which demand light, but graded light for employees. Light not only in the rooms but on staircases, in basement passages, on fire-escapes. Some of us can recall the revolting odor of a work room, gas illumined, and used all

day, the single gas jets on dark staircases, and now we see the harsh glare of unshaded electric light. These things cannot be trusted for rectification to the uncertain humanity of employers. Wise municipal law spells industrial efficiency, industrial efficiency would mean a good strikebreaker, because it would mean efficient brains. New York, New Jersey, Pennsylvania, California, Oregon and Ohio have excellent codes based on a tentative code drawn up by the Committee of the Illuminating Engineering Society, afterward adopted by the Committee of National Defence. There will be a sensible diminution of young patients at our eye clinics if all the good these codes hold out is brought to bear on the tired-eyed, painted, powdered, high shouldered, narrow chested girls who trip mincingly along in tight skirts after work to halls and movies to further strain their pretty eyes.

A MEDICAL LUNCH.

The English are becoming as clever in their ways of getting money as their American cousins. Who could refuse an invitation to a lunch given by one hundred clever women to one hundred clever men? The object was to get money for the Royal Free Hospital School of Medicine, where, sixty years ago, Elizabeth Garrett achieved distinction as the first Englishwoman to take a medical degree. There are now five hundred women students in the school. The air must have been rather too exhilarating, with the powers of two hundred clever men and women let loose. Fortunately, there were no discussions or the roof might have been blown off. Sir Alan Garrett Anderson, M. D., said that the best places of the profession were reserved for the consulting staffs of the great teaching hospitals, and the Royal Free was the only general hospital in the kingdom to admit women to the desired top platform. Princess Louise was the guest of honor, and had at her table women doctors of Harley Street fame. The home secretary was one clever man. Some others were Sir Eric Geddes, M. D., Sir George Newman, M. D., and Sir Owen Seaman, of *Punch*.

THE EYEBROW.

There is hardly a feature today which is not subjected to strict examination by the ubiquitous psychologist. An Italian doctor has been making a study of the eyebrow, and he has found that in dementia præcox there are nearly always short, bushy hairs nearly meeting in the space between the eyebrows and a noticeable thinning toward the external side. In epileptic women the eyebrow is made up of two portions, the inside is in the form of a comma, of which the tail enters in the two branches of the external portion in the form of a Y. In epileptic men one often sees large tufted, heavily haired eyebrows, united at the median line. In maniac depressive cases the absence of the outer third of the eyebrow is common.

News Items.

A Police Hospital in Tokio.—A hospital is to be erected in Tokio, at a cost of \$300,000, for the benefit of the city's 8,000 policemen and their families.

State Consultation Clinics for Tuberculosis.—The State Department of Health of Massachusetts has established a series of consultation clinics for early pulmonary tuberculosis.

Jewish Hospital Clinical Society of Philadelphia.—Dr. Myer Solis-Cohen has been elected president of this society to serve for the ensuing year. Dr. Irwin S. Meyerhoff was elected vice-president, and Dr. Joseph P. Besser, secretary and treasurer.

Woman's Hospital Society Gives Dinner to Dr. McGinnis.—The Woman's Hospital Society, of New York, gave a dinner to Dr. E. L'H. McGinnis on Tuesday evening, November 16th, in recognition of the work done by him during his many years' service at the Woman's Hospital.

Antituberculosis Crusade in Japan.—According to press dispatches from Tokio, Japan has inaugurated a widespread crusade against tuberculosis and a general campaign for public sanitation. Important social legislation has recently been enacted and national and municipal authorities are cooperating to enforce the new laws.

Dr. Baruch Honored.—A dinner was given in New York on Sunday evening, November 21st, in honor of Dr. Emanuel de Marnay Baruch, organizer of relief work for Germany and Austria. Two thousand persons attended the dinner, among them being Dr. Royal S. Copeland, commissioner of health of the city of New York, and other city officials.

Chicago Physicians Receive Honorary Degrees.—Dr. Ludvig Hektoen, of Chicago, had conferred upon him the honorary degree of Doctor of Laws at the centennial celebration of the Medical College of the University of Cincinnati. The honorary degree of Doctor of Science was conferred upon Dr. Dean Lewis and Dr. Edward O. Jordan at the same time.

Hookworm Infection in Australia.—Reports to the United States Public Health Service, dated August 24, 1920, state that a vigorous campaign against hookworm disease is in progress in Australia. In one district in the northeastern section of Queensland, out of 1,433 natives examined 216 were found infected, and in another district in the same section out of 1,592 natives examined 182 were found infected.

International Public Health Journal.—The first number of the new *International Public Health Journal* has just been issued by the Department of Medical Information, General Medical Department of the League of Red Cross Societies at Geneva, Switzerland. The journal will be devoted to all phases of public health work and preventive medicine and will be published every two months in four languages, French, English, Italian, and Spanish. Dr. Thomas R. Brown, of Baltimore, is editor, and Dr. William F. Francis, of Montreal, is associate editor.

Married.—Dr. Arthur Lewis Root, of New York, to Miss Edith Dow Merrill, in New York, on Wednesday, November 17th.

Dr. Harold F. Cleveland, of Holyoke, Mass., to Miss Regina B. Madden, at Brockton, Mass., on Sunday, November 14th.

Medal of Honor Awards.—Among the thirteen men in the Navy and Marine Corps who were awarded the Medal of Honor are the following: Lieutenant J. Boone, Medical Corps, United States Navy; A. G. Lyle, dental surgeon, Medical Department of the Navy; Lieutenant Orlando H. Petty, Medical Corps, R. F.

Lectures by Dr. Kenyon.—The Federation for Child Study announces three lectures by Dr. Josephine Hemenway Kenyon on The New Ideal of Health, Wednesday afternoons, at 2 West Sixty-fourth Street, as follows: December 1st, Influence Before Birth; December 8th, The Vital First Three Years; December 15th, The Neglected Preschool Period.

A Merger of Psychological Journals.—Announcement is made that, commencing with the January, 1921, issue, the two journals, *Psychobiology*, and *Journal of Animal Behavior*, will be merged under the new name of the *Journal of Comparative Psychology*. The new journal will be edited by Knight Dunlap and Robert M. Yerkes and will be published by the Williams & Wilkins Company, Baltimore.

Spanish Physicians Appeal to Government to Bar Foreign Competitors.—Press dispatches from Madrid state that the physicians and surgeons of Spain are greatly perturbed over the recent invasion of their country by foreign practitioners, more especially Austrians, who have been unable to find sufficient means for subsistence in their own country. In consequence, it was decided to appeal to the Government to make regulations under which foreign practitioners would have to acquire a medical degree in Spain before being allowed to practice.

St. Louis University Centennial Endowment Fund.—St. Louis University has asked its alumni and friends to raise the sum of \$3,000,000 as a Centennial Endowment Fund, in commemoration of the one hundredth anniversary of the founding of the institution. The anniversary occurred in 1918, but because of war conditions existing at that time, with over three thousand of the undergraduates and alumni of the University having answered the call to arms, the celebration was postponed until conditions were more nearly normal.

St. Louis University holds the distinction of having established in the great Louisiana Purchase tract the first colleges of medicine, dentistry, law, and commerce. Of the \$3,000,000 asked, the income on \$1,500,000 is for salaries of the teaching staffs of the colleges of medicine and dentistry; the cost of a new laboratory for the school of medicine is estimated at \$250,000; new buildings and clinics for the schools of medicine and dentistry will cost an additional \$550,000. The remainder of the \$3,000,000 will be applied to the needs of the Institute of Law, School of Commerce and Finance, and the College of Arts and Sciences.

New York Neurological Society.—At the next meeting of the New York Neurological Society, to be held Tuesday evening, December 7th, under the presidency of Dr. Walter Timme, the work of the Memorial Hospital on the radium treatment of tumors of nerve tissue will be presented, with lantern slide demonstration, as follows: Dr. Halsey J. Bagg, Experimental Study of the Effects of Radium on the Brains of Animals; Dr. James Ewing, the Structure of Nerve Tissue Tumors with Reference to Radium Therapy; Dr. Douglas Quick, Clinical Results of Treatment of Nerve Tissue Tumors by Radium. Dr. Walter M. Kraus will present two cases of Friedreich's Ataxia, and Dr. Charles Rosenheck will read a paper on Juvenile Tabes.

Associate in Clinical Psychiatry and Psychotherapy.—The United States Civil Service Commission announces an examination for associate in clinical psychiatry and psychotherapy, to fill a vacancy at St. Elizabeth's Hospital, Washington, D. C., at \$2,500 a year and maintenance. The duties of the appointee will be to act as consultant to the different medical services of the hospital, with the particular end in view of assisting in analyzing and understanding their patients. He will specifically undertake analytical and therapeutic measures in special functional cases that it would appear possible to benefit in this way. In addition to this work the appointee will be expected to avail himself of the clinical material and laboratory opportunities for special observation and research. It is desired to secure the services of a person familiar with the modern therapeutic movements in the practice of mental medicine. The appointee must not only be familiar with these movements, but he must be capable of an analytical and interpretative application of psychological principles to the individual case.

Personal.—Dr. W. A. Bridges, for the past year acting medical director of the Maryland Tuberculosis Association, has resigned to become superintendent of the Eudowood Sanatorium, Baltimore.

Dr. Walter Dill Scott, professor of psychology in Northwestern University, has been elected president of the university.

Dr. Alfred L. Gray, of Richmond, has been elected president of the Medical Society of Virginia, succeeding Dr. Fletcher J. Wright, of Petersburg.

Dr. Rudolph Matas, of New Orleans, has been elected vice-president of the American Medical Association to fill the vacancy caused by the death of Dr. Isadore Dyer.

Dr. Frederick W. Johnson, of Boston, has been appointed professor of clinical gynecology at Tufts Medical College, and Dr. Louis E. Phaneuf, of Boston, associate professor of gynecology.

Dr. William C. Braisted, surgeon general of the United States Navy, and Dr. Robert E. Le Conte, of Philadelphia, have been awarded the Navy Distinguished Service Medal for meritorious service during the war.

Dr. Lewis W. Fetzer has resigned as professor of physiology and pharmacology at the Baylor University College of Medicine and will take charge of the laboratories of the St. Paul Sanatorium at Dallas, Texas.

Women Physicians in the Orient.—The Woman's Foreign Missionary Society of the Methodist Church has just commissioned four women physicians and eleven women nurses for work in their hospitals in the Orient. The twenty hospitals under their care were depleted by the call for medical workers during the war and seven of them had to be closed, but these are now to be reopened. Among the physicians whom the society is sending is a young Chinese woman who has been studying medicine in this country for the past eleven years. She is to be at the head of one of the mission hospitals in her own country.

Meetings of Local Medical Societies.—The following medical societies will meet in New York during the coming week:

WEDNESDAY, *December 1st.*—New York Academy of Medicine (Section in Historical Medicine); Bronx Medical Association; Harlem Medical Association; Psychiatric Society of New York; New York Urological Society; Society of Alumni of Bellevue Hospital; Brooklyn Society for Neurology (annual).

THURSDAY, *December 2nd.*—New York Academy of Medicine (stated meeting); Brooklyn Surgical Society.

FRIDAY, *December 3rd.*—New York Academy of Medicine (Section in Surgery); New York Microscopical Society; Practitioners' Society of New York; Society for Serology and Hematology; Alumni Association of Roosevelt Hospital; Gynecological Society of Brooklyn.

SATURDAY, *December 4th.*—Benjamin Rush Medical Society.

A Medical Unit for Overseas.—Announcement is made by the Joint Distribution Committee of the American Funds for Jewish War Sufferers that a medical unit will be sent overseas next month to fight disease in Eastern Europe.

Dr. Harry Plotz, of Mount Sinai Hospital, medical adviser of the committee, has asked for \$2,000,000 to cover the first year's work and to provide for payment of the medical personnel, the purchase of medical supplies, the construction of bath houses, etc. Medical and hospital supplies will be distributed in connection with an educational health campaign. Dr. Plotz will be in charge of the work and will head the unit, which is to be made up of physicians with military experience. Applications for volunteers for the unit will be received by Dr. Plotz.

Died.

CHASE.—In Brooklyn, N. Y., on Monday, November 16th, Dr. Walter B. Chase, aged seventy-eight years.

DEVOR.—In Chambersburg, Pa., on Monday, November 15th, Dr. John H. Devor, aged sixty-three years.

DE LIGUORI.—In Waterbury, Conn., on Tuesday, November 2nd, Dr. John de Liguori, aged seventy-four years.

GERE.—In New York City, on Friday, November 19th, Dr. James Belden Gere, aged forty-eight years.

HAYES.—In New Bedford, Mass., on Tuesday, November 2nd, Dr. Stephen W. Hayes, aged seventy-two years.

JAMES.—In Lexington, Ky., on Monday, November 15th, Dr. Robert C. James, aged fifty-five years.

MURRAY.—In New York City, on Friday, November 12th, Dr. Elizabeth C. Murray, formerly of Cleveland, Ohio, aged sixty-five years.

SALTER.—In Buffalo, N. Y., on Friday, November 12th, Dr. Albert E. Salter, aged seventy-three years.

WHITE.—In Florence, Miss., on Saturday, November 13th, Dr. E. K. White, aged sixty-three years.

Book Reviews

NEW X RAY MANUALS.

Röntgen Interpretation. A Manual for Students and Practitioners. By GEORGE W. HOLMES, M. D., Röntgenologist to the Massachusetts General Hospital and Instructor in Röntgenology, Harvard Medical School, and HOWARD E. RUGGLES, M. D., Röntgenologist to the University of California Hospital, and Clinical Professor of Röntgenology, University of California Medical School. Illustrated. Philadelphia and New York: Lea & Febiger, 1919. Pp. xviii-211.

X Ray Observations for Foreign Bodies and Their Localization. By Captain HAROLD C. GAGE, A. R. C., O. I. P., Consulting Radiographer to the American Red Cross Hospital of Paris; Radiographer in Charge, Military Hospital V. R. 76, Ris Orangis, and Complementary Hospitals. Illustrated. St. Louis: C. V. Mosby Company, 1920. Pp. i-83.

Radiography in the Examination of the Liver, Gallbladder, and Bile Ducts. By ROBERT KNOX, M. D., Hon. Radiographer, King's College Hospital, London, England. A Series of Articles Reprinted from *Archives of Radiology and Electrotherapy*, July, August, September, and October, 1919. Illustrated. St. Louis: C. V. Mosby Company, 1920. Pp. i-64.

The x ray has invaded so many fields and engaged so many specialists in the task of perfecting technic and of working out new interpretations, that no general textbook covering the entire subject is available. For this reason the various manuals and monographs, of which the following are excellent examples, are of particular service:

An extensive territory is covered in Dr. Holmes's small volume *Röntgen Interpretation*. First the reader is cautioned against the errors he is likely to encounter, such as confusing shadows and artefacts. These have frequently led to faulty diagnosis in the past and will no doubt continue to do so in the future, but if the operator is on guard the possibility of error may be reduced to a minimum. Then some of the anatomical variations are presented. These, too, have led to error. Diagnoses of fracture have been made when the condition was merely one of delayed union of symphysis and diaphysis. We are then presented with a résumé of the most common usages of the x ray, fractures and dislocations in various parts of the body, the pathology of bone lesions and disorders, then the more common uses of the x ray on the skull. The chapter dealing with the joints is especially good, the illustrations being extremely clear. This is followed by chapters on the chest, the gastrointestinal tract, and the genitourinary tract.

The work is not complete and some of the illustrations, such as those illustrating pathological changes at the roots of teeth, are not satisfactory, but on the whole it is a most useful little guide book for the practitioner, showing him the many uses to which the x ray may be put as an aid in diagnosis.

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Mr. Gage was associated, for the greater part of the war, with Dr. Joseph Blake. He devised many useful methods for the localization of foreign bodies and these are described rather concisely in his small manual. No more painstaking worker could be found and his constant aim was to devise methods that were as simple and practicable as possible. He did away with many of the cumbersome meth-

ods that on account of their complexity gave the impression of great precision and substituted devices which were far simpler and at the same time no less exact. He was aided in his work by following the patients into the operating room after the foreign bodies had been localized and seeing his methods put to practical application. He presents a minimum of theory with a maximum amount of utility.

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This compend by Knox consists of a series of articles reprinted from the *Archives of Radiology and Electrotherapy*, and are worthy of being brought out in book form. The illustrations are the most valuable part of the book. They help clarify many of the hazy points in the none too simple problem of x ray examination of the gallbladder region. Among the photographs are several stereopticon views, which may be removed from the book and examined through a stereoscope, giving the exact relationships of the technic described. Surgeons are prone to place little reliability on radiographic findings in the gallbladder region. Perhaps this presentation will establish confidence in the method.

PHYSIOLOGY AND BIOCHEMISTRY.

Physiology and Biochemistry in Modern Medicine. By J. J. R. MACLEOD, M. B., Professor of Physiology in the University of Toronto; Formerly Professor of Physiology in the Western Reserve University, Cleveland, Assisted by ROY G. PEARCE, A. C. REDFIELD, N. B. TAYLOR, and Others. Third Edition, with Two Hundred and Forty-three Illustrations, Including Nine Plates in Color. St. Louis: C. V. Mosby Company, 1920. Pp. xxxii-992.

Most important changes have been made in the section on the nervous system in this, the third, edition of Macleod's book. This work was done by A. C. Redfield and he has succeeded in presenting the subject in a manner best calculated for practical application in a therapeutic sense. Fortunately, the striving shown here is constantly toward the clinical usages to which the researches of both laboratory workers and clinicians may be put.

Other subjects which have called for changes in the text due to the progress made in their respective fields are the chapters on vitamins, surgical shock, and capillary circulation. While the endocrines have come in for their share in the revision it seems as though, in a book of this character, more could have been said without going beyond the borders of safety. For example, little is said about the pineal or thymus. Perhaps the authors have not dared to venture in this little explored field in a work of this kind, yet a beginning should be made, and it might be well to present what is known of the more obscure subjects rather than rehash and elaborate some of the physiological phenomena merely because there is less divergence of opinion regarding a special subject. The parts dealing with the chemistry of respiration are entirely revised, yet it seems as though some of the work done on the endocrine glands, especially on the adrenals, could have been incorporated into this phase of physiology.

RELIGION AND HEALTH.

Religion and Health. By JAMES J. WALSH, M. D., Ph. D., Sc. D., etc., Medical Director of Fordham University School of Sociology; Professor of Physiological Psychology, Cathedral College Lecturer on Psychology and Sociology, Marywood College, Scranton, Pa., Mt. St. Mary's, Plainfield, N. J. Boston: Little, Brown & Co., 1920. Pp. 341.

A cheery young lieutenant who spent his leave during the war with a sad relative, said, "I suppose it's being religious makes aunt so beastly miserable." He was only voicing a thought which comes to many who are chilled and puzzled by the behavior of the religious. A young man who was accidentally locked up in a refrigerating room, when asked how he felt, said, "Just as I did when I went to a social tea at a church." Such discourteous youngsters would do well to listen to Dr. Walsh, as he gives an absolutely fair hearing to the assertions of religion and health. What one man has done, man can do. Disease, plus religion, can see a man mentally and morally triumphant. Disease, lacking religion, sees the pitiable sight of a slow deterioration in body and also in soul.

That which should have been Chapter One has wandered away to the end of the book. This treats of a morbid condition in which ill health is mistaken for spiritual declension and gloom settles down because a person is too lazy to take a walk or a blue pill. To the question at the beginning of the book, Can we still believe? Dr. Walsh brings a long array of eminent scientists to prove that the divorce between science and religion is three quarters imagination. The calming effects of prayer in disease and health are more powerful than is realized. An old French invocation to prayer begins: "Come, let us gather ourselves together," which exactly expresses that calm concentration of thought likely to make the practice beneficial. Fasting and abstinence, holidays and holydays are shown to have sound medical backing for their reasonable usage, though the author believes in a more extensive abstinence from excessive rest, regarding it as a mischievous source of selfishness and laziness. The old eight hour plan is his.

We sin always when we think too much
Of what we think and are. Albeit our thoughts
Be verily as bitter as self-sacrifice.
If we sleep on rocks or roses, sleeping past the hour
of noon
We're lazy.

A sharp distinction is drawn between recreation and dissipation, and he deplors those who have no mental recreation, but must seek it all outside in shows and vaudeville and dances. The pleasures of sense, unbridled by religion, are never held fully in check by mere commonsense motives. He deprecates the modern idea of sex teaching in schools and public places. Young folk have not been terrified by the knowledge of the hideous possible consequences of impurity. The temptation comes with hurtling force against those who have not been grounded in faith. You cannot neutralize sex temptations by the provision of knowledge alone.

The increase in suicide is traced to the decrease of attention to religion and the absence of religious training in youth. The suicides have no courage to

face the small trials which lead to it. Lessening of the reverence for human life and a lessening of the awfulness of murder have also increased homicide.

The author quotes from his own experience with patients to show how true religion may dominate pain and continuous suffering. Of cancer alone scarcely less than a hundred thousand persons will die of it during the next twelve months in this country alone; over a million and a half throughout the world. Where no religion is this must only mean just so much pain to be borne without any good reason as far as they can see. He gives so many instances of work heroically done in spite of suffering that it almost seems as if those enduring it were called to "active service" instead of ingloriously abiding in barracks.

The book will deter many from suffering the will of God, when, in reality, they are yielding to their own inclination in not resisting disease. Fewer persons will put "Thy Will Be Done" on tombstones, because they will realize, after listening to Dr. Walsh, that the Lord prefers living, healthy persons to diers, and, having realized, will brace themselves to eradicate all that is unseemly in their religion and health.

THE LIGHT HEART.

The Light Heart. By MAURICE HEWLETT. New York: Henry Holt & Co., 1920. Pp. xii-188.

Maurice Hewlett knows how to write of men and things as they are. He gives flashing pictures from human life and its settings, or better still he has the grace that lets such pictures speak for themselves. There were men of old times whose lives as they moved and spoke were much like the abrupt setting in which they lived. Hewlett has searched their records, the tales of Iceland and the forbidding country about it. He reads, as no one who comes close to their literature can fail to do, the direct honesty, clearcut action, and the play of heart gripping love or the impairing subtlety of treachery which passed over their lives. Though "the starkness of their Sagas shocks" this writer of modern times he is skillful in his sympathy in portraying the high relief and the softer shadows of these people. They are far away in time as they are remote through their difference in climate and the forbidding circumstances which this brings with it. No time or space separates them from us in elements of character, in the varying interplay of the elements which distinguishes each individual so clearly in these northern tales. There is here in *The Light Heart* a man who is a friend of man, devoted to an ideal attachment even unto death. Thormod carries a light heart toward the necessities of everyday toil or everyday responsibilities. "He had the poet's way of thinking rather than of doing, that knack of working out the ways of a deed so fully in the mind that when the time comes to do it, it seems already done, and done with: wherefore you simply leave it undone." He was equally indecisive in his affairs with women, and, therefore, took such affairs lightly and left them off without further concern, or only that of the feeblest. He could turn and look back upon himself in a similar impersonal fashion.

His devotion to his friend, Thorgar, had something of the same objectivity. He felt that he loved him for what he saw him to be and dared not risk surprising him lest he should find him sometime something different. But there was a steadfastness, a seriousness, in his love for this friend, and then for the hero that follows that means his life for them. There are these two tales of the power of one man's love which Hewlett has woven into one continued story. Thorgar is slain and Thormod, half heathen as he was in the dawn of a Christian Iceland, consecrates himself to a sweeping vengeance in the spirit of the sworn friendship they had compacted. This done, carried out with cold deliberateness and unstaying violence in the narrow settlements of Greenland, Thormod returns to a newly found friend, King Olaf. At their first meeting at King Olaf's court, in the slaughter of the king's losing battle, Thormod's love is swift, intuitively sensitive, straight to its mark. It renders simple uncringing homage, and in the end can be satisfied only to be with the king also in death.

The book has not such inspiriting force as some of Hewlett's earlier reproductions of Icelandic literature. But neither has Thormod the vigor of character which marks the Icelandic's restraint and ferocious unrestraint. There is a roundabout elaborateness in the execution of Thormod's deeds, and in the general light aloofness of his character. A light heart, yet a widely human one, and it centres itself on the type of love which is his. Hewlett found Thormod the man, not Thormod's deeds, the theme of the two tales woven here. Through him modern literature is enriched by one more representative human soul.

THE AMERICAN RED CROSS IN ITALY.

The Story of the American Red Cross in Italy. By CHARLES M. BAKEWELL. New York: The Macmillan Company, 1920. Pp. viii-253.

The Armistice had been signed. The tricolor had been planted on the Brenner in the north and the Julian Alps in the east. All Italian lands had been redeemed, but new burdens had to be carried, for the prosperous little towns along the Piave were heaps of ruins. Along the Brenta, up through the Val Sugana and the Val Lagurina, desolation, desolation. Army banners were furled, the fight was not now against alien foes, but against starvation, despair, disease, and thousands of ill clad, hungry released prisoners.

The one unfurled banner bore an emblem of defeat. "The Kingliest Kings are crowned with thorns," the royal arms had been stretched on a cross, yet, for four long years they had valiantly headed a fight unarmed, but victoriously, against slaughter and hellish pain, rapine and desolation.

The story of the American Red Cross, read when the Armistice is two years old, read in the relative quiet of a restless peace thrills with its brimming cup of misery its triumph when tears of blood marred strong men's faces, when hatred and despair were just able to nerve shaking hands for one more effort.

When the first call came for help, the American Relief Clearing House had emptied its warehouse

and treasury. It turned its offices over to the Emergency Commission, and the Clearing House became the agent of the Red Cross in the Roman district, being given at once 100,000 lire for purchase of supplies for refugees. One afternoon news was received that 12,000 refugees would pass through the Portonaccio Station, the first train arriving at six. Within an hour the Red Cross had the baggage car on the northbound Florence express loaded with supplies, and it arrived before the first refugee train. The Permanent Commission of the Red Cross, under Colonel Perkins, arrived in Rome in December, 1917.

There were only thirty-two workers at first; at the end of the war it numbered 949 not including the enrollment of Italians, approximately one thousand more.

The book is not written in praise of America. It is a modest record penned for those interested, but it is wonderfully lucid, keeping a clear track right through the war, never wearying with statistics and accounts, but giving stern facts and glances humorous and tender, of helpers and helped. One little piece of postwar work was the returning to America (according to promise) of Italian American citizens who went over to serve. In November, 1919, nearly four thousand, mostly with families, were gathered in Naples, waiting to embark. The Red Cross came forward with funds to provide extra clerks for checking the passports and relieving the wants of those necessarily detained in Naples.

The Red Cross Army of every nation sets out this year on a peace time campaign against the Devil and all his works, and the Devil is a fine military tactician. Perhaps the words of a young Italian learning English may aptly close this brief review: "Hurry for Uncle Sam: Hurry for Wilson: Hurry for Italy and our King."

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

THE DARK MOTHER. By WALDO FRANK. New York: Bonj & Liveright, 1920. Pp. 376.

MAN'S UNCONSCIOUS PASSION. By WILFRED LAY, Ph. D. New York: Dodd, Mead & Co., 1920. Pp. 246.

THE CRESCENT MOON. By F. BRETT YOUNG. New York: E. P. Dutton & Co., Third Edition, 1920. Pp. 284.

THE HOUSE OF LYNCH. By LEONARD MERRICK. With an Introduction by G. K. CHESTERTON. New York: E. P. Dutton & Co. 1924.

RESURRECTION. By LEO TOLSTOY. Translated by ARCHIBALD J. WOLFE. In Two Volumes. New York: International Book-Publishing Company, 1920. Pp. vol. i, ix-337; vol. ii, 398.

TASCHENBUCH DER KNOCHEN-UND GELENKTUBERKULOSE (Chirurgische Tuberkulose) mit einem Anhang: Die Tuberkulose des Ohres, des Auges und der Haut. Ein Leitfaden für den praktischen Arzt. Von Dr. H. SCHWERMANN, Facharzt für Tuberkulose, Oberarzt am Sanatorium Schwarzwaldheim Schömberg-Neuenbürg. Mit 10 Abbildungen im Text. Leipzig: Verlag von Curt Kabitzsch, 1920. Seiten 150.

Practical Therapeutics and Preventive Medicine

A Compendium of Treatment and Prophylaxis, Original and Adapted

Intravenous Hydrogen Peroxide in Influenzal Pneumonia.—T. H. Oliver and D. V. Murphy (*Lancet*, February 21, 1920) report an exceedingly severe epidemic of influenza among the Indian troops in Busrah where the mortality in the toxic bronchopneumonia cases was eighty per cent. So hopeless were all of the accepted methods of treatment that they felt justified in trying intravenous hydrogen peroxide to combat in a measure the anoxemia and theoretically to attack the toxemia by means of the nascent oxygen liberated. Two ounces of ozone in eight ounces of water were injected into the veins during the course of fifteen minutes, with stops of half a minute in every four. The danger of gas embolism was appreciated, hence the long duration of the infusion. Also the infusion was watched very closely at the cannula and when a large bubble was seen the rate of infusion was greatly reduced. The method was used on twenty-five patients, all of whom were *in extremis*. Thirteen recovered and twelve died. Of these twelve, nine showed no visible change either for the better or the worse, while three improved temporarily. One patient only died within five hours of the infusion, in a rigor. Of the thirteen recoveries, ten patients were delirious at the time of the infusion and three were comatose. In these patients the average respiration before was 46, and twenty-four hours after infusion it was 31.5. The average pulse was 118 before and 98 twenty-four hours later. The average temperature was from 101-103 and in all save one instance the injection was followed by a rigor, after which—except in two cases—the temperature fell to normal. The afebrile period lasted eighteen to thirty-six hours when the temperature rose to 99-101 and fell by lysis in four to seven days.

Certain Points in the Diagnosis and Treatment of Pulmonary Tuberculosis.—Lawrason Brown (*American Journal of the Medical Sciences*, September, 1920) asserts that not every patient in whom a diagnosis of pulmonary tuberculosis can be made needs vigorous treatment. It was an attempt to discover a simple method that any practitioner could use in his office that led to the study of active and inactive cases, but no simple method was found. He believes that in considering the need for treatment, symptoms vastly outweigh physical findings in the majority of cases. Tubercle bacilli can occur in a perfectly quiescent case, where it is only necessary for the patient to lead a quiet life, but when the bacilli are found in a patient who has recently begun to show symptoms, vigorous treatment is demanded. Râles can persist for years in arrested cases. The x ray helps greatly in revealing changes that occur from time to time, but an increase of x ray shadows may occur months before the last plate has been taken, and at that time the disease may have been arrested. Any patient with unexplained pleurisy with effusion needs treatment for pulmonary tuberculosis, unless a parenchymat-

ous lesion in the lungs can be definitely excluded, and even then he inclines to the side of caution, for a slight deposit may be lost in the cloudiness that obscures that part of the plate. An inexplicable hemoptysis should be similarly treated. Suspected pulmonary tuberculosis he treats by rapidly increasing the patient's exercise to the unlimited stage, and after about three months, if all has gone well, return him to his work. Dr. Brown believes that after a careful study the patient can be taken into confidence and told the possibilities frankly.

Glucose as an Adjunct Measure in the Treatment of Pneumonia.—Henry J. John (*American Journal of the Medical Sciences*, October, 1920) comes to the following conclusions: 1. The administration of glucose is without danger provided any reasonable care is used. In the twelve hundred administrations not a single accident occurred. The patient is made comfortable and sleep is provided for him. Through this the whole organism is strengthened for the prolonged fight against the infection. 3. The temperature is lowered. 4. Nutrition is provided for the overtaxed heart muscle without having to go through the ordinary digestive processes, storage in the liver as glycogen and reconversion into glucose again before it can be burned by the tissues. One hundred to three hundred calories are thus supplied to the body in each dose. 5. A considerable amount of fluid is provided for the circulation. This, together with the preceding, slows the heart, thus producing artificial rest. 6. The elimination through kidneys and skin is increased. 7. Practically all the medication can be supplied in the glucose, thus a much more accurate dosage can be depended on. 8. The antipneumococcic serum type I or the anti-streptococcic serum, the antitetanic serum, can be administered in this glucose medium. This is far superior to saline, for glucose will do much more than saline, thus being a much more rational medium to use as a diluent for any intravenous medication. 9. The use of glucose is strictly a physiological measure and is to be used as such.

Therapeutic Tracheal Fistula in Laryngeal Tuberculosis.—G. Rosenthal (*Paris médical*, April 17, 1920), in cases in which the initial examination of the larynx already reveals large ulcerations, loss of epiglottic tissue, and grape seed points of edema on the arytenoids, already threatening closure of the larynx, performs tracheotomy in order to rest the larynx. Injection of oil containing gomenol and guaiacol or iodoform three times daily through the cannula is at once instituted. Large amounts are given, either with the syringe—twenty mils— or by the author's "drop" procedure—twenty to fifty mils. Two or three syringefuls of a one in 200 solution of French novocaine are introduced beforehand to anesthetize the parts. As soon as rest has led to some regression of the laryngeal lesions, the necessary surgical measures are carried

out by direct laryngoscopy to destroy completely the local tuberculous process. The ordinary cannula is then replaced by the author's cannula for therapeutic tracheal fistula, which is shaped like the adult's cannula but has the calibre of that used for tracheotomy in a child. The oily injections are continued through this small cannula, and also through the third one, subsequently used, which measures only three millimetres in external diameter. Later, if improvement continues, a two millimetre cannula is substituted, and the injections are given by the natural route, i. e., by way of the mouth. In cases not so advanced as to demand ordinary tracheotomy, though too far advanced for the ultraviolet rays and chemical or galvanic cauterization, a small tracheal fistula cannula is first inserted, and larger cannulas later inserted if necessary, before resorting to the actual, mutilating tracheotomy. The needle used to prepare the way for the small cannula is curved and measures six to seven tenths of a millimetre in diameter. It is introduced through the cricothyroid space, but fails to injure the posterior tracheal wall, as do the straight needles rather recently recommended. The two or three millimetre cannula, coupled with the pulmonary "drop" instillations, may suffice to arrest the expectoration. Later, if required, the larger tube may be used, though without causing closure of the upper respiratory route. By this general method the need for ordinary tracheotomy is restricted to the most severe cases.

Action of Rare Earth Salts of the Cerium Group in Experimental Tuberculosis.—Albert Frouin (*Bulletin de l'Académie de médecine*, June 15, 1920) injected sulphates of lanthanum, neodymium, praseodymium, and samarium intraperitoneally in fifty animals, beginning seven days after inoculation with tubercle bacilli and repeated twice weekly and later once weekly. In guineapigs 0.2 mil of a one per cent. solution of the salts was the amount injected. These animals lived an average of sixty-three days longer than the ten controls not receiving salt injections. In a second series of thirty guineapigs those receiving the salts lived an average of forty-five days longer than the ten controls. Rabbits were inoculated in the marginal ear vein with a suspension of bovine bacilli, and six hours later ten of them were given 0.5 mil of the one per cent. solution of salts intravenously; 0.25 mil was administered twice weekly thereafter. Three rabbits died before the two controls, but the other seven lived three to five months longer than the controls. In many of the guineapigs there was found in addition to extensive tuberculous lesions, an adhesive peritonitis uniting all the abdominal viscera and the abdominal wall with sheets of connective tissue. The omentum appeared as a fibrous cord. In other animals, with less extensive adhesions, a more or less pronounced fibrosis of the lymphnodes, omentum, and the liver was observed. This connective tissue reaction is looked upon as a defensive process similar to that met with in old, latent tuberculous foci which are being recovered from. A connective tissue in the lungs was similarly met with in rabbits that had lived four or more months after tubercle inoculation in the blood stream.

Heat Hyperpyrexia.—W. H. Willcox (*Lancet*, March 20, 1920) discusses his observations on this condition as it existed among the troops in Mesopotamia. Regarding etiology, the chief factors were a temperature of over 110° F. in the shade, lasting over several days with a stagnation of the air. No age is peculiarly susceptible to the condition but the mortality is higher in men over forty. Predisposing causes are exertion during the heat of the day and any infectious disease which normally raises the temperature of the patient. The types of illness into which the cases were classified are: 1, Mild heat exhaustion; 2, gastric type where the patient had a flushed face, was restless and irritable with nausea and occasionally vomiting and where the temperature was only slightly elevated; 3, gastrointestinal type with sudden onset and collapse, nausea, vomiting and diarrhea, and often with cramps in the legs and abdomen; and 4, heat hyperpyrexia with sudden rise in temperature and loss of consciousness and finally death after convulsions. The onset and course varied greatly and all sorts of peculiar symptoms were noted. Among the more constant findings were a marked cardiac dilatation with a systolic murmur lasting several weeks, an excess of indican in the urine, and a very frequent loss of the knee jerks in the more severe cases. Acetone and diacetic were found in the urine in only a few cases. The treatment of the gastric types consisted in removal of the patient to a cool atmosphere, bicarbonate of soda in full doses by mouth, and free purgation. Heat hyperpyrexia demands treatment with sprays of ice cold water, fans, and quinine hydrochloride intravenously or intramuscularly if there is the slightest suspicion of malaria. Convulsions are treated by venesection morphine or chloroform inhalations.

Influenza as an Etiological Factor in Nephritis.—W. W. D. Thomson and H. F. Macauley (*Lancet*, February 28, 1920) report four cases of nephritis in the children of one family, manifesting itself about three weeks after an attack of influenza in each instance. The condition was characterized by an edema and albuminuria of varying severity, the presence of epithelial and blood casts with erythrocytes and leucocytes in the urine, and by a favorable course with recovery. The literature on the subject is extensively summarized and the following conclusions are drawn: 1. Nephritis is a more common complication of influenza than is generally supposed. 2. The virus may affect the kidneys in various ways: a, producing a transient albuminuria; b, causing an acute nephritis during the course of the disease; c, resulting in an acute nephritis during the course of convalescence; d, lighting up a latent nephritis. 3. Nephritis may follow even a mild attack of influenza. 4. The nephritis may be such a slight and transient affair and the symptoms of the influenza so pronounced that the diagnosis will not be made unless a careful routine examination of the urine is done. 5. Probably the frequency and severity of the complication varies in different epidemics and in different localities. 6. The examiners of applicants for life insurance may expect to find a higher proportion of albuminuria than in normal times.

Radium Treatment of X Ray Epithelioma.—P. Degrais and A. Bellot (*Presse médicale*, June 5, 1920) report three cases in which epithelioma or obstinate ulcerations due to professional x ray exposures were successfully cured with radium. Such results will enable those called upon to treat cases of this type to dispense with amputation of the affected extremity in the future. In one of the cases reported by the authors three excision operations had already been performed and been followed by recurrence. The ulcers soon healed under radium, and the accompanying severe pain was wholly relieved. Hyperkeratosis due to the x rays likewise yielded to radium, used in the same manner as for the treatment of warts.

A Study of the Relative Toxic Effects Produced by Regional Radiation.—W. Denis and Charles L. Martin (*American Journal of the Medical Sciences*, October, 1920) thus summarize their paper: 1. A definite massive dose of x rays administered to the body of a rabbit produces a severe systemic reaction and death only when some portion of the intestinal tract lies within the irradiated area. 2. It is possible to produce a definite acidosis (lowering of the alkaline reserve) in rabbits by administering a heavy dose of x rays over the abdomen. Such animals give no evidence of suffering from a röntgen ray nephritis. 3. The results suggest the hypothesis that acidosis may be a factor in treatment sickness following abdominal irradiation.

Treatment of Penetrating Injuries of the Eyeball.—H. H. Roth (*International Journal of Surgery*, September, 1920) gives the following conclusions for the conservative treatment of penetrating injuries of the eyeball: 1. Radiographic examinations should be made in every case of ocular injury from any penetrating substance, especially where lowered visual acuity is the result of the accident. 2. The use of the conjunctival flap in penetrating injuries of the cornea and sclera is our greatest aid in preventing infection and prolapse of the internal structures of the eye. 3. Hexamethylenetetramine is a remedy to be used in all injuries involving the opening of the eyeball in order to prevent and combat infection, and it can be given freely and over an extended period of time, and in only a few cases does it produce renal symptoms.

The Bone Flap in Cranial Surgery.—Harvey C. Masland (*Annals of Surgery*, October, 1920) gives the following summary of the operation he uses for cutting the bone flap in cranial surgery: The preliminary openings, usually but two, are small. The relations of the power and of the construction of the trephine to the skull opening are so adjusted that the trephine must jam before penetrating the dura. If the preliminary saw cut through the outer table is used the guard is immediately adjustable to the depth desired. The inside guard is of a shape to secure easy separation of the dura, and there is fine tactile sense of its efficiency in this respect. There is no burning of the bone and so the vitality of the exposed osteoblasts is preserved. There is bone support for the replaced bone flap. If a greater provision for internal pressure is desired the bone flap can be variously sectioned in vital fragments to gain the desired end.

X Ray Treatment of Universal Psoriasis.—John Remer and W. D. Witherbee (*Medical Record*, August 28, 1920) report approximately one hundred cases successfully treated in the past year by this method. They are convinced that it is the simplest and most satisfactory method of treating this disease. The x ray exposures are preferably given three times a week, allowing a day between each two exposures. For the first treatment, the head and arms are exposed, in the second treatment the trunk and buttocks; in the third, the legs and thighs. The treatment is concluded in from four to eight weeks, depending on the severity of the case.

Preoperative Treatment of Diabetic Patients.—Max Kahn (*Surgery, Gynecology and Obstetrics*, October, 1920) gives the following rules for preoperative treatment of diabetes: 1. Keep the bowels open, preferably by enemata, in order to avoid diarrhoea and the consequent drainage of alkaline salts from the body. 2. Administer fluids in liberal amounts—a glass of liquid every hour or hour and a half. 3. Increase the tolerance for carbohydrates. 4. Avoid substances that induce the formation of the acids—such as fats, and sometimes proteins. 5. Administer substances which favor the combustion of the ketones, as for example, oatmeal, levulose, alcohol, etc. 6. Do not prescribe alkalies.

Advantages of Extension in Diseased Joints.—W. A. Lane (*Lancet*, March 22, 1920) records his conversion to the use of traction instead of fixation in the treatment of diseased articular surfaces. The reason why the method is so useful is that traction permits of so little friction between the surfaces that only a mild transient inflammation is set up when the joint is moved instead of the severe inflammation which results from the bruising of surfaces which are not held apart by traction. Then too such a procedure tends to furnish the joint with a more free blood supply than is otherwise the case and the muscles are allowed to function normally.

Combined Intramuscular and Subcutaneous Antitoxin Administration in Diphtheria.—P. F. Armand-Delille (*Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, March 18, 1920) comments on the rapidity of absorption of antitoxin when it is administered intramuscularly, the use of this route constituting a definite step forward in diphtheria treatment. Since, however, serum thus given is rapidly eliminated, late symptoms such as paralyzes developing where this method is used alone, it should be supplemented next day by another dose given subcutaneously in order to keep up the effect. The author's present routine procedure in cases of average severity in children three to ten years of age is to give thirty to forty mils of serum intramuscularly at once, and on the next day forty mils subcutaneously. This dose may be increased in the event of toxic or malignant angina with extensive and extending membranes. If, on the third day, there is still a membrane, leading to the suspicion that toxin is still being formed owing to insufficient neutralization by the earlier injection, a third subcutaneous injection of thirty to sixty mils is given. In croup the speed of action of the intramuscular dose is plainly manifest, but the added subcutaneous dose should nevertheless be given.

Miscellany from Home and Foreign Journals

Clinical Diagnosis of Diphtheria.—H. Drinkwater (*Lancet*, May 29, 1920) reaffirms the necessity of early diagnosis in diphtheria and gives several clear directions for the accurate clinical diagnosis of the condition with points of differentiation from follicular tonsillitis and Vincent's angina. He divides the fauces into six areas, three on either side, the tonsillar, the uvular and the palatal areas. Every area may show some deposit and in any area there may be one or more patches. In diphtheria the deposit in any one area is always single though there may be several patches on the fauces. The same is true in Vincent's angina. In follicular tonsillitis there are several patches on the tonsils and the same is found in influenza. The characteristics of the diphtheritic patch are three. 1. It is raised above the level of the mucous membrane. 2. The edges are sharply defined all around. 3. The color varies greatly from glistening white to bluish or yellowish with patches of black or red. Vincent's angina is the most difficult to differentiate from diphtheria and in some cases it is impossible to make the differentiation without microscopic and cultural methods. But there are several characteristics which when present serve to make the diagnosis. When the fauces show a sharply defined vertically directed ulcer in which the membrane extends scarcely beyond the edges of the ulcer the diagnosis is clinically Vincent's. Also when the lower edge of the membrane is thinned out and the border is ill defined, a diagnosis of Vincent's should be made. In follicular tonsillitis and influenza the multiple patches in the various areas rule out the diagnosis of diphtheria.

Abscess of the Liver.—A. L. Candler (*Lancet*, February 21, 1920) discusses his experience with liver abscess in the British general hospitals of Mesopotamia. *Entamoeba histolytica* was the cause of the condition but in the series of three cases of hepatitis and thirteen of abscess, a history of diarrhea was obtainable in only three instances. Of the two fatal cases the bowel at postmortem showed only one small healing ulcer in the ascending colon in one instance and no abnormality at all in the other. Also in the stools of twelve of the series amebæ were found in only three. Hence the conclusion is made that probably in the amebic dysentery cases so slight in bowel involvement that the diagnosis is impossible, hepatic abscess is much more likely to develop than in the clear cut cases which are diagnosed early and the patients given a thorough course of treatment. Liver abscess does not give a clear cut clinical picture as there are wide variations in temperature, pulse, respiration and leucocytosis, though all are often moderately raised. Tenderness or tumor can usually be made out when the process is on the anterior surface below the costal margin. In the usual subdiaphragmatic location, however, the signs are less characteristic. Enlarged liver, raised upper border of dullness, bulging of diaphragm as shown by x ray, and raised arch of dullness under the axilla must suggest the

condition strongly. The diagnosis, however, is made by obtaining pus through a needle, if possible, or by laparotomy, if necessary. Treatment consists in opening and draining the wound, irrigating it with a solution of ten grains of quinine to the ounce and keeping both the wound and the cavity sterile by careful dressing. Withdrawal of the drainage tubes at the earliest possible moment lessens the likelihood of infecting the wound and so hastens the healing process. Hypodermic injections of one grain of emetine hydrochloride daily for ten days must be given as general treatment and, after a rest, repeated if necessary.

The Thymus as an Endocrine Organ.—A. P. Dustin (*Prèsse médicale*, June 5, 1920) asserts that the hitherto accredited theory that the small thymic cells are true lymphocytes and the Hassall bodies epithelial derivatives with an endocrine function can no longer be considered valid. The only really functioning cell is the small thymic cell, which resembles a lymphocyte but is actually derived by a strictly special process from the primordial epithelium of the thymus. The main function of the organ is division of these small cells by karyokinesis and disappearance of the cells by pyknosis, nuclein derivatives being set free in the system. This liberation of nuclein material by the thymus is strongly influenced, if not initiated, by the thyroid gland. The thymus thus acts as a regulator and disseminator of nucleins and their derivatives in the organism. Important applications of these facts may be made in morbid conditions of the thymus, lymphoid formations, tumors, and in the biochemical disturbances of nucleinic metabolism. The organ does not operate, as would a gland, through a secretion, but by fixation of substances of the nucleoproteid group in the condition of actual formed elements or cells.

Clinical Diagnosis of Typhus Fever.—J. Rieux (*Paris médical*, June 5, 1920) summarizes the earlier clinical manifestations of typhus fever as follows: Any patient who, after being taken ill rather suddenly—i. e., who can tell on what day he became ill—without any definite localization of the disease, shows a progressively rising and later constant febrile temperature, marked headache with unpleasant dreams, severe prostration, a pulse rate of 100 to 120 a minute, always proportionate to the temperature, and injection of the conjunctivæ, without any abdominal or pulmonary symptoms, should be looked upon as a typhus suspect. The suspicion is confirmed when the typhus eruption appears, about the fourth or fifth day. The differentiation from typhoid fever rests mainly upon the mode of onset, the lack of agreement between the pulse and temperature in typhoid fever, the presence of intestinal and pulmonary symptoms in the latter affection, and the presence of conjunctival injection in typhus. Extraneous factors of diagnostic import include the epidemicity of the disease, which is a cold weather affection and occurs in massive but dragging epidemics, similar to epi-

demics of measles or mumps. Transmission of the disease by lice is also an established fact of possible diagnostic significance, though some physicians, orderlies, and especially nurses contracting the disease have asserted that they did not harbor any of these parasites. The Weil-Felix reaction is an accepted laboratory test, but is not available until the end of the first week. Negative results of blood cultures and examinations for malarial organisms and the spirillum of Obermeier are thus of greater significance early in the disease.

A Study of the Blood after Splenectomy, with Special Reference to the Leucocytes.—Milton W. Hall (*American Journal of the Medical Sciences*, July, 1920) thus summarizes the results of his observations: The removal of the spleen resulted in a considerable increase in the total leucocyte count which persisted with much irregularity for over three months. In the early period all types of white cells were increased in nearly the same proportion, although a slight increase of endothelial cells was noted at the expense of the lymphocytes. In the intermediate period both total and differential count showed such marked variation as to render averages valueless, but the total count usually was high. In the final period a comparative equilibrium was reached, with a moderate increase in the total count, due entirely to lymphocytes and endothelial cells, while the granular leucocytes showed strictly normal figures. The endothelial cells were constantly increased both relatively and absolutely. The observations in the Arneth index suggest that the increase in the count is at least in part due to the removal of some factor restricting the production of white cells. No eosinophilia appeared during the course of the work.

Effects of Occupation and Race on the Health of Recruits.—G. R. Hall (*Lancet*, June 5, 1920) compiles statistics made available by the wholesale examinations of British recruits. An examination of 2,500 men suffering from heart disease revealed the fact that only forty per cent. suffered from valvular disease of the heart, while in the rest illness was due to want of tone or to other minor, and nearly all curable, conditions. Apparently there were two cardiac cases among the dark recruits to one among the light. In 8,000 men, the feet were defective in 23.8 per cent. of cases, flatfoot being the usual fault. The teeth were bad, in a state to affect health, in 42.5 per cent. of the 8,000; 14.6 per cent. also showed defects of the genitalia but varicocele was the chief defect, comprising eighty per cent. of the cases. Of 20,141 recruits, 6.2 per cent. were referred to the ophthalmic surgeon, and 2.5 per cent. of these men were rejected. As to racial effects on the health of the individuals, it was found that among the Russian Jews there was a definitely higher incidence of various diseases and defects than among the British men in all cases except in valvular disease of the heart where the incidence was distinctly higher among the British. It was also found that the young Jews who had been brought up in England were approximately as healthy as the British youths, indicating that the Russian Jew is not racially defective but that he has suffered from his environment.

Delayed Symptoms in Fracture of Vertebral Bodies.—Robert H. Baker (*Surgery, Gynecology and Obstetrics*, October, 1920) in a discussion of Kümmel's disease presents the following conclusions: 1. Compression fracture of the spinal bodies without cord symptoms is frequently undiagnosed, or incorrectly diagnosed at the time of injury. 2. A negative finding by the x ray at the period of initial injury is not proof positive against fracture. 3. Symptoms referable to the fracture may not occur for some time after injury. 4. At this later period the signs and x ray findings are all in keeping with a diagnosis of compression fracture of the spinal bodies. 5. The exact sequence in the pathology leading to such a diagnosis is not understood. 6. The prognosis will depend on the time of diagnosis and the institution of proper treatment. 7. The treatment is that of compression fracture of the spine.

Involvement of the Auricle and Conduction Pathways of the Heart Following Influenza.—Walter W. Hamburger (*American Journal of the Medical Sciences*, October, 1920) reports six cases of postinfluenzal myocardial involvement, in which the auricle and conduction pathways of the heart were particularly affected. From a study of the literature, together with clinical and electrocardiographic studies, he offers the following grouping of postinfluenzal cardiac complications. 1. Fatal cases showing acute parenchymatous degeneration and vacuolization of the myocardium. 2. Nonfatal acute cases showing involvement of auricle and conduction system during height of infection, with complete restoration to normal cardiac mechanism with subsidence of infection. Duration two to six weeks. 3. Nonfatal chronic cases with arrhythmia and involvement of the auricle persisting and causing partial invalidism long after subsidence of acute infection. Duration twelve to seventeen months—plus. He suggests that acute respiratory infections single out early the auricle and conduction pathways of the heart.

Vital Capacity Constants in the Study of Pulmonary Tuberculosis.—G. Dreyer and L. S. T. Burrell (*Lancet*, June 5, 1920) report the results of their studies on the vital capacity in normal individuals and in persons suffering from active or quiescent pulmonary tuberculosis. The formulæ with the methods of measurement are given in detail together with brief abstracts of the reports on two hundred cases. The authors feel justified in drawing the following conclusions: 1. There is a definite decrease in the vital capacity of the tuberculous patient, taking into account the nature of his employment and his general physical condition. 2. The vital capacity of the individual increases with the clinical improvement and decreases with advance of the disease, thus giving a numerical index as to the progress of the case. 3. The determination of the vital capacity of the case furnishes a useful means of classification of the extent and severity of the condition. 4. The measurement furnishes an aid to diagnosis in doubtful cases for if it is normal there is no tuberculosis present. 5. The measurement also furnishes an index to the efficacy of any method of treatment.

Proceedings of National and Local Societies

BRITISH NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.

*Annual Conference Held in Liverpool, England,
October 7, 8, and 9, 1920.*

The President, SIR ARTHUR STANLEY, in the Chair.

(Concluded from page 832.)

Importance of Early Treatment.—Dr. HALLIDAY SUTHERLAND, of London, dwelt upon the great need for timely treatment. The reason why results were so bad was that patients arrived in a too far advanced stage of the disease. On one occasion he was asked by a doctor to take in a favorable case. Not knowing the doctor, he consented. When the cab arrived at the institution the man in it was dead. They could not expect a miracle in anything subject to natural forces. If the machinery they now had was used properly the problem would be solved in a generation. He strongly deprecated the lumping together of all cases, slight and advanced.

Tuberculosis and Poverty.—BAILLIE JAMES STEWART, of Glasgow, said that poverty, with its attendant disabilities, bad housing and food, was the chief cause of tuberculosis, and asserted that until poverty was abolished these conferences would go on.

Practical Difficulties in Connection with Carrying Out Tuberculosis Schemes.—Dr. J. G. ADAMI, F. R. S., formerly professor of pathology in McGill University, Montreal, now vice-chancellor of the University of Liverpool, delivered a forceful address in which he pointed out that the tuberculosis problem was not altogether or even primarily a medical one unless it was considered as possible that some specific medicinal cure, that would be promptly effective, could be discovered. If such a drug could be obtained, one that would destroy the bacillus, he doubted whether it could be introduced into the body in sufficient concentration. Could all cases of tuberculosis be isolated and kept isolated, in ten years' time tuberculosis would be rendered as rare in Great Britain as was leprosy. This idea was not feasible, however; no Chancellor of the Exchequer would advance the funds requisite, nor, unless a periodical physical examination of the entire population was inaugurated, could a considerable proportion of these cases be detected. What was possible, however, in positive cases, was to segregate the patients in large numbers. The greater the proportion of those isolated, the more rapid the reduction in the incidence of the disease. The four essentials were recognition, notification, isolation, and treatment. A combination of voluntary and official support was essential and would be most economically brought about by the establishment of local tuberculosis dispensaries. Professor Adami went on to describe the working at the Royal Institution, Montreal, of the class treatment introduced by Dr. Joseph Pratt, of Boston, Mass., and declared that this method of treatment gave far better results than the sanatorium treatment at a

lower cost for each patient. He urged a modification of the system, together with the establishment of camps and night camps for open air treatment in the parks and gardens of cities and towns, as being the course along which the best and most economical results could be obtained.

Dr. W. H. DICKINSON, of Newcastle-on-Tyne, said recovery among the poor was nearly always retarded by financial embarrassment. This should, as far as possible, be remedied by local and State assistance.

Reforms Needed in Sanatorium Management.—Dr. CHARLES MINOR, of Asheville, N. C., said that what was needed was reform in the management of public sanatoriums for the working classes. The whole staff from the medical superintendent down should be of the right kind, who would treat the patients as human beings having souls as well as bodies. No good results could be obtained by mixing cases. When managed aright, tuberculosis was not the hopeless disease it was supposed to be. However, Dr. Minor advocated the mixing of the sexes. If the assembly were all women it became catty, and if all men it became rude, and they had to be brought together in order to get a civilized family. The cantankerous people should be put together in one ward. He advocated cheerfulness.

Importance of an Accurate Diagnosis.—Dr. B. J. I. GLOVER, of Liverpool, referred to the importance of making an accurate diagnosis on the part of the tuberculosis officer, and to the fact that certain cases of chronic bronchitis were sometimes wrongly labeled as tuberculous and sent into sanatoriums, thus wasting valuable beds.

Milk and Tuberculosis.—The last session of the conference was devoted to a discussion of the milk question. Sir Robert Philip, of Edinburgh, was in the chair.

Dr. A. W. MACFADDEN, of the Ministry of Health, opened the discussion and said, in part, that the figures indicated the present exceedingly low consumption of milk in industrial districts and the wastage in milking herds from tuberculosis. He laid stress on the importance of milk to the community, especially as a means for supplying accessory food factors. Tuberculosis in cattle made the business of milk production an unprofitable one to the farmer. When the new legislation had come into full operation two per cent. of their stock might be expected to come annually for slaughter under the provisions of the tuberculosis order. From the consumers' point of view he noted that in Dr. Stanley Griffith's recent report to the Medical Research Council twenty per cent. of the cases of human tuberculosis examined by him were found to be of bovine origin. He referred also to the research being carried out at the present time at the Reading Agricultural College to determine the most economical means of producing and distributing wholesome milk. Under the new legislation, part of which is still before Parliament, county councils will, for the first time, be brought into

touch with the machinery of production. Local authorities will be empowered to appoint a sufficient number of veterinary surgeons to carry out the inspection of dairy cattle in their districts. It is anticipated and hoped that this scheme of inspection will result in bringing to light the cases of tuberculosis in cattle, which will then be slaughtered and compensation paid according to the provisions of the tuberculosis order. The system of granting certificates to farmers who produced milk of a certain quality had resulted in the production of some tubercle free dairy stock and was a valuable experiment.

Professor J. M. BEATTIE, of Liverpool, stated that proprietary milk preparations for the feeding of children were not practical substitutes for fresh milk, and that the sterilization and pasteurization of milk were not a guarantee against tubercle infection. Professor Beattie dealt with three main methods of preventing infection by means of milk. Samples of dried milk had not shown tubercle bacilli, but experience had demonstrated the fact that the process of suspension was often imperfectly carried out in the home, so that the child got sometimes little besides water, and often a fluid that was contaminated in manufacture. Professor Delépine had found living bacilli in milk dried over cylinders heated to 138° C.-140° C. Pasteurization also killed tubercle bacilli in the great bulk of cases when properly carried out, but the commercial methods used in Great Britain were very ineffective. His experience, however, in examining samples from the Liverpool Infant Welfare Centre, showed that if properly carried out the method of sterilizing milk by heating it was effective. The milk, however, must be heated above 70° C., at which temperature the milk proteins underwent some change. The results of sterilization at lower temperatures by electricity had been unsatisfactory. The rational method of procedure was to control milk at its source of supply and he suggested systematic inspection of dairy herds, and examination of composite samples of milk from these herds, with special samples from animals suspected of tuberculosis, together with the isolation, on special isolation farms, of any suspicious animal.

Sir ROBERT JONES, of Liverpool, said that in any children's hospital the cases of surgical tuberculosis might be divided into three groups: 1, tuberculosis, 2, poliomyelitis, 3, rickets. Half of the cripples, among whom he practically spent his life, were tuberculous. Furthermore, two thirds of the infection in these tuberculous children was bovine in character. In nearly every instance the infection could be traced back directly to the cow. If such cows were not slaughtered they should be branded so that they could not pass from a controlled to an uncontrolled area to infect a new series of children.

Dr. PAUL A. LEWIS, of the Henry Phipps Institute, Philadelphia, explained how the American system of grading had arisen through the supply of milk to large concerns, who often had to transport it 500 miles to the cities. He said that this system had been the largest single factor in the education of the farmer, who was naturally anxious to secure the higher prices paid for higher grades

of milk. In the large towns where only grade A milk could be sold there had been a marked diminution of gland tuberculosis. This diminution had not occurred in country districts where the less satisfactory milk was still obtainable.

Dr. DINGWALL FORDYCE, of Edinburgh, said that although it might seem ridiculous to say so, the medical profession was not as well educated as it should be in the elements of child nurture. It would be better for the nation if there were small healthy families rather than large ones in which many of the children died. Dr. Fordyce recommended that all milk sold in Great Britain today should be boiled. Babies could be fed successfully on boiled milk if vitamins were supplied additionally through fruit or vegetable juices.

Professor STENHOUSE WILLIAMS, of Reading, made the most striking speech of the discussion and recounted the difficulties which had confronted the dairy trade, the members of which had always been most anxious to adopt the best measures for the purification of the milk supply. It had been very difficult to procure money or facts to support research. In order to insure a decent milk supply there must be the right man in the cow house. No inspector would rise early enough to control the milking conditions. The milker must, therefore, be educated and given a good wage. At least two per cent. of cows, which to outward appearance were in good health, were giving tuberculous milk. Such milk was sent out from four farms out of fourteen. Not only did these cows affect milk directly, but their dung remained infected for twelve months if kept in a dark place and so might contaminate other milk. Nothing less than the tuberculin test would eliminate these cows from the herds. The farmer asked how he was to replenish his stock if the tuberculous cattle were destroyed. They had presented a scheme four years ago for raising nontuberculous cows at Reading to replace cows so eliminated, but money had not been forthcoming. Another practical difficulty was the absence of any standard tuberculin or any standard method of using it. He condemned vigorously the propaganda which would excuse the consumption of tuberculous milk on the ground that it immunized children. The dose of tubercle bacilli was unknown, and it was not possible to say that the bacilli which entered the child's body did not remain latent and reappeared after a lapse of years as human bacilli.

Dr. J. RUDD LEESON, of Middlesex County Council, made the most iconoclastic speech of the meeting, endeavoring to upset all traditional views as to the nutritive properties of milk. He followed in the footsteps of Dr. Harry Campbell, but out-heroded Herod, denying any virtues in milk as a food. Rather he regarded it as a menace to the health of a country, saying that he would prefer to see a barrel of gunpowder in a house than a glass of milk. He declared that people had no business to drink milk. It was quite unnatural, as was shown by the fact that when a child's teeth came the mother's milk ceased and that applied to all mammalia. He looked upon the drinking of milk as one of the curses of civilization.

Dr. WILLIAM ALLEN DALEY pointed out that the determination of the presence of bacilli in milk by inoculation tests took too long, and advocated research to discover a more rapid method.

Resolutions on Tuberculosis Prevention.—The following resolutions were moved by Sir ROBERT JONES and seconded by Dr. HYSLOP THOMSON:

That this conference viewed with satisfaction the growing interest that was being shown throughout the country in relation to the prevention of tuberculosis. It reaffirmed its belief that the methods which were being adopted were justified by the results obtained, and would urge their still more vigorous prosecution. In particular it would urge the Government to consider the immediate institution of a more definite system of medical inspection in the case of certain industries where tuberculosis was especially rife. It would also urge that the Tuberculosis Order, 1914, be brought into operation with as little delay as possible. The conference further resolved that these resolutions be sent to the council of the National Association for the Prevention of Tuberculosis with a view to their transmission to the Prime Minister, the Minister of Health, and the Minister of Agriculture.

A discussion then took place in the course of which Dr. E. I. McDONALD, tuberculosis officer, County Carlow, Ireland, made an insistent plea for more adequate remuneration for the general practitioner, who at present was given the vital and difficult task of discovering early cases without reward. The resolutions were then put to the meeting and carried unanimously.

The Liverpool branch of the Church of England Temperance Society gave a breakfast on October 8th to the members attending the conference. Dr. HAIË, who presided, said that alcoholism was a national question, and though we might not feel it wrong to drink alcoholic beverages ourselves, we must look upon the whole problem with a social conscience.

Alcoholism and Tuberculosis.—Dr. I. N. KELYNACK read a paper on this subject, in which he dealt first with the direct action of alcohol, quoting the late Sir William Osler in support of the contention that the resistance of the body to infection was lowered by its use. But the chief way by which the alcoholic exposed himself to infection from tubercle bacilli was through the indirect effects of addiction upon personal hygiene and upon social and domestic conduct. Those who were improperly fed and clothed as a result of poverty through drink fell an easy prey. Much contagion was contracted at the public bar. Dr. Kelynack read a symposium of opinions in agreement with his own, contributed by Sir Robert Philip, Sir George Sims Woodhead, Sir Thomas Oliver, Sir Henry Gauvain, Professor Hope, Professor E. L. Collis, Dr. Nathan Raw, and Dr. C. T. McAlister. He concluded by urging additional research on alcohol and tuberculosis by the profession and for a school campaign of temperance education along the lines recommended in the new syllabus of the board of education. Agents of insurance bodies, in his opinion, should give health instruction in England as they did in America.

The keynote of the meeting with regard to the

tuberculosis problem, as with the problem of all disease at the present time, was that prevention is better than cure, and in order effectually to prevent there must be earnest and intelligent cooperation between the medical profession and the community.

Too great reliance had been placed upon sanatorium treatment, and grave defects in the system had made themselves evident which to a considerable extent minimized its value. It was now obvious that in order to stamp out tuberculosis in the first instance, early diagnosis was essential. The disease could be successfully treated in the early stages but was not amenable to successful treatment when infection had gained a firm foothold. Consequently the rational mode of dealing with tuberculosis was by the exercise of preventive methods. Of course, such methods were notoriously difficult to bring into play. Early diagnosis was immensely difficult—it seemed almost impossible—and the milk question was another hard nut to crack. But these problems must be faced and solved if success was to be complete. Furthermore, it was necessary, if the spread of the disease was to be controlled, that those who were in the stage of the disease which made them a menace to their neighbors and the community must be segregated. These were the two important problems to be solved in the campaign against tuberculosis: early diagnosis and appropriate treatment, and the segregation of the sufferer when he had become a danger to the public.

At the outbreak of war progress had been made in the treatment, preventive and otherwise, of tuberculosis, but war conditions naturally rendered all efforts of no avail, and during the war the disease had made great headway. In Great Britain, at the present time, the whole matter was being reconsidered and the treatment established on a somewhat different basis. It was recognized that the main hope of eradicating the disease, or even of greatly diminishing its incidence and prevalence, lay in prevention reinforced by the segregation of those in an advanced stage of the malady. To this end, therefore, there was needed education of the public, for without education cooperation would not come, and without cooperation an early diagnosis could not be made and proper treatment instituted before it was too late. With respect to many details involved in the tuberculosis question, America was considerably ahead of Great Britain.

Nutrition Clinics and Tuberculosis.—William R. P. Emerson (*Boston Medical and Surgical Journal*, September 16, 1920) says that the problem of tuberculosis is for the most part the problem of nutrition. If children can be made well in a sanatorium, they get health; but if they can be cured in their own homes, they get health, with health education and character. Nutrition work, which covers a new and hitherto neglected field in medical work, must be carried on with proper authority. It cannot fit in as an adjunct to other programs, but other programs must be adjusted to fit the problem of nutrition, which is the fundamental problem of tuberculosis.

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Original Communications

THE PARATHYROID AND CONVULSIVE STATES.*

General Considerations.

BY SMITH ELY JELLIFFE, M. D.,
New York.

I shall attempt to present certain general conceptions which have helped me in my efforts to analyze some of the problems which in general we speak of as the epilepsies. In this attempt to bring some formulations before you I may be considered somewhat tedious in so far as I shall deal with some elementary considerations which I deem essential to pave the way to certain aspects of the situation.

Such elementary considerations involve the general hypotheses of the science of energetics. For the purposes of our discussion I shall ask you to assume that the human being is not an isolated bit of living matter, a shut in system acting by itself and independent of its environment. It is no such thing. It, like all other living organisms, is a highly complicated, greatly involved and ingeniously intricate system or systems of mechanisms, whose chief and only functions are the capture, the transformation, and the release of energy. This energy, as you well know, comes from cosmic sources, and although the human being has not yet evolved to such a point that it can utilize all of the surrounding energy it does manipulate enormous quantities of the energy that impinges upon it and for the most part manipulates it for the well being of that individual and for the continuance of living beings, the race.

Further elementary considerations force me to remind you of some of the remarkable anatomical structures by which the capture, the transformation, and the release of this energy are made possible. Anatomically and neurologically speaking, the term receptors is used to describe those mechanisms which gather the energy in from innumerable cosmic sources. This capture of energy by the receptors has been in progress many million years and is performed automatically, unconsciously, unceasingly for the most part, and the functions have become structuralized into organs, which are still undergoing slow evolution, unrecognizable as changing even by the best means at hand for morphological observation. Solely for the purpose of illustration I shall remind you of only a few of the receptor mechanisms which have built up complex structures in this

effort to obtain energy from the universe. The weight of the earth, its relation to other masses in the universe and the effects upon all bodies in the environment we speak of as gravity. The muscular system, particularly that part of it known as the anisotropic disc system in so-called voluntary muscle, is one of the bits of structure which has been evolved in response to this constantly acting gravity energy system. The chief receptors, so far as morphology has penetrated these structures, lie within the muscles and tendons and constitute parts of an extremely complicated apparatus, which correlates the controls from many sources of our command over spatial relations through muscular action. We are not now interested in this control part of the machine, the transformers, but are speaking of the energy source side. Thus the globe is constantly working on our body and supplying it with energy stimuli.

Again let us turn to light stimuli. Light not only acts upon the optic receptors of the eye, but it is acting on the layer of pigment which in the Malpighian layer is found throughout the entire body. Here is a constant energy supply that must be handled by the body machinery. Whereas we must confess to an almost abysmal ignorance concerning these mechanisms, Cajal's recent work on the nervous structures of the skin, McCord's observations on the action of pineal substance upon melanophores permit us to conjecture some tentative working hypotheses concerning the pineal as a part of this particular functional group.

Food is, from my point of view, a comparatively insignificant source of the energy that the human being captures and transforms. It is all important, however, in supplying the chemical elements which are essential in the transforming machinery.

As some of you know, from a special point of view, I have maintained that the most important of the energy sources that the human being handles is the energy that is transformed or brought over into the human mechanism through the dynamics of the symbol. It would take us too far afield to discuss the hypotheses which science is working with concerning these mechanisms.

So, then, conceive of these receptors, connectors and effectors capturing, transforming, and releasing enormous amounts of energy. In the evolution of this process, as you know from your anatomical considerations, a highly complicated and closely integrated series of nerve structure arcs has been

*Revised notes of paper given at the National Association for the Study of Epilepsy, June 14, 1920.

devised. These arcs are broken here and there, by anatomical structures which have received the name of the synapses, in order to permit a greater facility of distribution of the energy being transformed for various vital processes. Here again I must depreciate the definiteness of our knowledge concerning the great complexity of the synapse. Morphologically we know almost nothing about them; physiologically we know a little more. We know just a little concerning the electrophysical resistance to the passage of energy at the synapse. Some of this I have summarized from my own observations and the literature of the laboratory, particularly as it has been partially revealed in working on the problem of tetany (1). Now it is particularly to some of the work that is carried on at the synapse that I wish to call attention; so far as convulsive phenomena combined with a series of other phenomena are concerned, which gathered together constitute the nucleus of the epilepsy problem, I feel that any light thrown upon the machinery at the synaptic junction level is of value in the solution of parts of the epilepsy problem, even though such value may be restricted, because no interpretation of so complicated a group of phenomena as the epileptic phenomena can ever be completely explained at a physicochemical level. If I may outline a very concrete analogy, I may speak of this synaptic junction somewhat in the light of a hair trigger in a gun. Whereas oiling the hair trigger may induce a more rapid explosion of the contents of the gun, the directing of the gun, here, there, or somewhere else, namely at the target, has little or nothing to do with the hair trigger. That is, the epileptic phenomena *en gross* can only be explained as the gun *in toto* with the man behind the gun. The ultimate comprehension of the epileptic phenomena will only receive its adequate setting when the investigation of the unconscious of the individual who is behind the gun is integrated with the other parts of the machinery. But so far as the present analogy is concerned an analysis of the mechanisms of the hair trigger may be of certain limited service. For it is certain that the electrical resistance at the synaptic junctions, peripheral, spinal, medullary, cerebellar, midbrain to cortex, and back again to the muscle and plate effectors, control the energy discharges and distributions, and aid in the integration of the machine, in its work of proper and adequate supply of energy for metabolic and projicient purposes. This electrical resistance serves at least a double service. It functions for time, and thus attempts to control the flow of energy from one neuron to another within orderly time relations. Concerning this timing function we have some definite information, *loc. cit.* It also functions for quantitative capacities, and through the elaborate network of synaptic contacts permits a balancing in dynamic distribution along physiological limits.

Both of these functions are perturbed in the groups of convulsive disorders, spasmophilia, tics, choreas, and other disturbances, as well as many of the convulsive phenomena of the epilepsies. The problem of localization of the perturbed synaptic junctions cannot be entered into just at this moment.

Now the functional integrity of the synapse, among a host of other relations, is intimately bound up in the problem of the integrity of the bivalent cations of the body, of which calcium and magnesium are the most frequently found in the chemical fundamentals of the human machine. Calcium plays an important rôle, we know perfectly well, as we more or less intensely study the phenomena of tetany, and it is by reason of this aspect of the subject that I have hazarded these general remarks. As you know, tetany is almost always associated with deficient parathyroid function. Such parathyroid modifications may originate from innumerable etiological factors. Whether we can have specific parathyroid malfunctioning independent of other endocrine activities I shall not attempt to state. In defective parathyroid states the necessary calcium integration factors seem to be most seriously interfered with. The hypothesis would state that these glands regulate the proper distribution of the calcium for its numerous functions, one of which is the specific activity of regulating the synaptic junction function; there seems to be little doubt that it is so involved. So, then, coming around to the physicochemical point of view, all convulsive phenomena may be scrutinized to advantage from the viewpoint of possible "hair triggeriness," that is, a diminution of resistance to the passage of electrical stimuli with perverted synaptic junction function, primarily brought about through parathyroid dysfunction.

This only takes us to a very general statement. Which synapses in the chains are chiefly involved? Are they those of the incoming arcs, or those of the outgoing ones? Is it a problem of faulty capture and short cut distributions in a faulty manner, or are the difficulties to be sought on the effector sides of the mechanism? These questions cannot yet be answered. Paton and his coworkers have attempted an analysis of the tetany situation along these lines, in which, however, they have omitted several synapses in their discussion, having made the functioning neural arcs too simple. But it was not my mission to solve the epilepsy problem. I wished only to discuss one defect of a general nature, which, if found in any human machine, made it more difficult for that machine to distribute its energy properly under stress or strain. Clearing up a general underlying mechanical defect of the distributing apparatus, might permit the machine to function better even with a faulty biological teleology, which a study of the unconscious might reveal as present. Certainly a very poor gunner, who might not be certain concerning his quarry—a forester or a deer—would have a serious handicap if the trigger of his gun were so touchy as to go off with the slightest pressure, maybe of his finger, maybe of a swishing branch of a shrub, or a sudden jolt from uncertain footing. With security in that part of the machine his chances might be better for his goals. Thus the work at the synapse may throw some important light on the problem to which this society has devoted itself.

Just one word more then from a possible therapeutic point of view, which has been partially experimented with by myself and more or less ex-

tensively reported on by Bolten, and a number of investigators who have found that by parathyroid therapy in certain types of individuals where there was a certain definite causal relationship between parathyroid disease and the possibility of controlling certain factors in the convulsive phenomena, very excellent results have been obtained.

My opinions are still in a formative state, but the results which I have obtained from investigation and the reports obtained by reading the literature indicate that some help in controlling certain of the factors which I have outlined may come from a carefully considered parathyroid therapy. Just to feed parathyroid to every epileptic and expect him to get well is as silly as to give every man in New York a brick and expect to get a Woolworth building. Behind the type of cases of possible action there should be present the specific features of the "hair trigger" synaptic activity. Careful study of the patient for all of the tetany reactions is needed, then one may have some foundation. Therapeutics is so empirical at best, however, that even a shotgun use of the parathyroid may bag a bird when one least expects it. Interestingly enough, it has seemed that parathyroid given by rectum in its crude state is its most effective form. Given in other ways, by the gastrointestinal canal, it undergoes destructive digestive changes; even hypodermic use seems to alter its composition, but taken by way of the rectum it would appear that no such deterioration takes place, and some very surprising and striking results have been obtained, not in the cure of an epileptic specially, but in the help of this one particular factor which I have tried to emphasize in this rather condensed communication.

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64 WEST FIFTY-SIXTH STREET.

MORE ADEQUATE PROVISION FOR EPILEPTICS.*

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One may ask what is now being done in America to meet the needs of the many thousand epileptics not under any particular care or supervision? Are the established institutions serving their respective communities to the greatest degree possible? While many of the epileptics referred to would probably never be required to come under direct institutional care, nevertheless the question arises, Should extension work be arranged either as clinic days at Craig Colony or at a distance where epileptics unable to consult a physician might come for examination and advice? In a recent communication from one of long experience in the care and treat-

ment of epileptics, the present situation in New York State regarding the care of these people was well summed up in saying the provision was lamentably inadequate.

The general subject of care and treatment of epileptics in special colonies or villages, as well as in the outside world, has been so well covered in the literature of the past thirty years or more that there can be nothing better expected at this time than to call attention to certain phases of the problem already minutely described, stress their importance and strive to make them effective to a broader extent than has been thus far accomplished. We can but aim to bring about a more general application of the principles advocated by Letchworth, Peterson, Spratling, Clark and others.

From the twenty-sixth annual report of the State Board of Charities of the State of New York, 1892, page 373, I would quote: "The colony idea is essential, as is shown by the express language of the law as well as its spirit, and by the needs and nature of the proper care and treatment of epileptics in community life. This colony design includes not only the separation of the patients into detached buildings, but the arrangement of the cottages upon irregular lines and at different distances, in accordance with the situations of the various building sites, adapted to the selfsupport of the inmates through natural advantages for economy of administration, and for the successful prosecution of trades, industries and agricultural labors."

The writer of the foregoing apparently expected the epileptics to be received would be of good mentality, whereas upward of sixty per cent. of those received at Craig Colony, since its first patient was admitted in January, 1896, have been markedly impaired mentally.

Established in 1894, the Craig Colony with a moderate amount of funds for new construction, made available annually, should have had before this capacity for at least two thousand patients, with every ordinary facility for affording them humane, scientific and economical care and treatment. The slowing up in development of Craig Colony long antedated the World War. As a fact, during the past decade, practically no appropriations were made for additional dormitory cottages or for other coordinated structures required to permit of developing the Colony along the general lines so well laid down nearly twenty-five years ago. The few cottages built have been provided to replace old Shaker structures no longer suitable for patients.

A portion of Section 1, of Chapter 331, of Laws of 1907, being an act authorizing the selection of a site for what is now Letchworth Village, reads as follows: "Section 1. Selection of lands.—For the purpose of acquiring a site for the Eastern New York State Custodial Asylum which it is proposed to establish for the care of epileptics and other feeble-minded persons needing custodial care."

The commission appointed to select the site mentioned in its report that figures obtained showed conclusively that there was a large number of dependent epileptic and feeble-minded persons for whose proper care, treatment and education the state had made no provision. In comment upon this, I desire

*Read at the annual meeting of National Association for Study of Epilepsy, New York, June 3, 1920.

to call your attention to the fact that up to the present, thirteen years later, the state has made no further provision for the epileptics referred to in this report, as subsequently the law governing Letchworth Village was modified or at least its interpretation changed so that only the feeble-minded are received. The intention of establishing a separate institution to which only the most defective class could be sent was not a good policy.

The population of New York State is such that to care for its epileptics as they should be cared for, the state must needs establish districts as it did long since for the insane, and is now preparing to do for the feeble-minded. If this were accomplished and the sites fixed on, there should be a sufficient area in which to locate groups for the housing of all types of epileptics within that radius. The annual census of the dependent epileptics in the state as required by the State Board of Charities does not bring forth satisfactory information to approximate the total number who might demand or desire care in a colony. Many counties either report no epileptics or very, very few in comparison with their population.

The rounding out of the Craig Colony by the erection of various buildings listed in the original plan, is plainly indicated so that the scientific and therapeutic ends for which the institution was established may be progressively furthered. A minimum of markedly defective, primarily custodial cases should be ultimately provided for at the colony. If the project, already referred to, of districting the state is eventually accomplished, those patients offering some possibility of improvement or an arrest of symptoms should be given preference in the list of applicants seeking admission. This, however, cannot be done until the colony is provided with the necessary places in which to accommodate more applicants of this type and the means of treating them in an up to date, scientific manner.

In the fifty-third annual report of the New York State Board of Charities for the year 1919, the following is submitted, referring to Craig Colony: "But as it is estimated that the ratio of epileptics in the general population is one to five hundred, one institution having a capacity of one thousand four hundred inmates, situated in the extreme western part of the state, is not sufficient provision for a population of ten million or more persons. It is impossible to care adequately and properly for the needs of the state at Sonyea, where there is constant overcrowding and where a long waiting list is constantly maintained. The great distance from New York City is an additional hardship to the patients who are separated from friends and relatives for long periods of time. There should be in the vicinity of the metropolis an institution for this type of sufferers, and in addition there should be provided throughout the state clinical and dispensary facilities whereby discharged patients and potential epileptics may receive aftercare and expert advice in the treatment of their disorder."

The Hospital Development Commission in New York State in its report submitted to the Legislature under date of February 18, 1918, stated: "We are not prepared to say that another institu-

tion for feeble-minded should be authorized. The institution at Letchworth Village was originally intended for epileptics. Today this original purpose has been lost sight of, and perhaps properly so. The Craig Colony for Epileptics is another phase of the same problem. This institution has patients who are both insane and feeble-minded. A great many epileptics ultimately become insane. It is a question whether hospitals for the insane should care for insane epileptics or whether institutions for epileptics should care for that class, or whether the Craig Colony should be regarded as a charitable institution, or should come under the control of an existing commission or some commission should be formed in the future. The question arises in connection with this entire situation as to what is mental normality and what is defectiveness. Can any sharp line be drawn between the two? The ability to make a proper social adaptation in one station of life may be much greater than that required in another circle, and so on."

In practically every other state, except New York, the institutions for the care of the insane, feeble-minded and epileptic are all placed under the same commission or board.

On February 1, 1920, there were a little over a thousand epileptics residing in the various state hospitals for the insane in New York State: Binghamton 73; Brooklyn 34; Buffalo 77; Central Islip 128; Gowanda 29; Hudson River 117; Kings Park 128; Manhattan 162; Middletown 65; Ogdensburg 61; Rochester 42; Utica 49, and Willard 90; giving a total of 1,055. Of this number, a considerable proportion might be cared for in an institution such as the Craig Colony if proper buildings were available. With the removal of the majority of the epileptics from the hospitals for the insane, there would then be made available many beds for the ordinary insane.

At the present time, the only states providing separate institutions solely for the care of epileptics are the following: Ohio, New York, Massachusetts, Kansas, New Jersey, Indiana, Texas, Michigan, Iowa and Ontario, Canada. Pennsylvania and Missouri have private institutions for epileptics. Of the remaining states, the majority either care for epileptics in separate cottages or wards in institutions for the insane or the ordinary mentally defective. Three states, Illinois, Connecticut and Virginia, originally established separate institutions to be devoted solely to the care of epileptics, but have since changed the type of institutions so as to care for both epileptics and feeble-minded in the same institution. In most of those states having separate institutions, because of the present unsettled state of affairs, it is not expected to increase their capacity materially in the near future. In Ohio there has been some agitation for the starting of another hospital for epileptics, as well as in New York. In Ohio, during the past year, there has been an increased capacity by 250, and by next year it is expected that there will be a similar additional increase in capacity. In Michigan the capacity was increased by 215 during last year. Indiana has buildings nearing completion to permit of adding to its capacity for a considerable number, but owing to such a

great increase in the cost of construction, appropriations will not nearly permit of erecting buildings of the size originally planned for. Indiana desires to erect a structure where any physician in the state can send an epileptic for observation, diagnosis and suggestions as to treatment, similar arrangement for which should be available in all states, so that such individual could be received for a short period without any steps for commitment being made necessary. New Jersey is seeking to secure a considerable appropriation so as to enlarge its village for epileptics. At the Craig Colony additional structures have been built to increase the capacity by two hundred, but cannot be made available until provision is made for housing nurses and attendants, when they can be secured.

I may be pardoned perhaps if I review some of the ideals to be sought after when establishing a colony. The site should be reasonably near a city or large town, and contain tracts available for the erection of buildings without necessitating a great amount of landscape effort.

The first patients to be admitted should be those epileptics mentally and physically capable, barring an occasional seizure, of working regularly and requiring the least supervision. If at the onset patients are admitted irrespective of their physical or mental disability, or of both, it will be difficult with such a handicap to develop the institution properly during the early days of its existence when every bit of energy that can be secured should be utilized for constructive purposes. The colony will grow toward completion more satisfactorily if this one idea is borne in mind. Many of those sent to a colony should be kept there indefinitely, both for their own good and for that of the public.

One of the greatest problems institutions have to contend with is the providing of proper care and supervision for those of its inmates who are markedly defective mentally. These will not ordinarily improve materially as a result of colony treatment. The average epileptic does, however, after a residence of several months show more or less improvement, in regard both to his epilepsy and to his general health, some having a complete cessation of seizures.

The educational work of an institution for epileptics is exceedingly important. It should be developed along such lines as not only to care for all of the younger patients whose mental state permits of educational effort being applied but should be extended so as to care for some of the patients of a more advanced chronological age, who because of restricted environment during their earlier years were deprived of educational advantages. Education with the epileptic is of peculiar value as it must be considered not only from the ordinary viewpoint of assisting in the mental development of the individual but also for its therapeutic value. The pathetic side, especially, of the epileptic school child should appeal to all. He is capable of study, yet deprived of school opportunities because of his disorder. This is often sufficient to prevent any relief being afforded him, as it brings discouragement and perhaps results in an exaggeration of his symptoms. Craig Colony is arranging to have its educational

department affiliated with a neighboring State Normal School. Under such an extension plan the pupils will receive desired standards of instruction and the Normal School can train many of its student teachers in methods practical in nature to be made use of in special classes in schools throughout the state and really give better understanding of normal children.

William Pryor Letchworth mentions the importance of extended classification in institutions for epileptics, e. g., sex, adults from children, different grades of mentality, etc. All of those having experience in state institutions will agree that the thoroughness with which this classification can be carried out has a great bearing on the degree of success attainable in care and treatment, especially of those of better mentality. As classification is of fundamental importance in approaching the ideal of individual treatment, too much stress cannot be laid on the desirability of having small buildings, the details of the interior construction of which make for not only easier and safer but more beneficial care for epileptics. Large buildings in a colony are entirely contrary to the first principle of colony organization. The smaller the cottages and the nearer they approach a home, the greater the success in classifying and the more nearly the structure affords contentment for its residents.

There should be available in a colony, cottages for patients who become temporarily confused. From time to time patients who under ordinary circumstances are of such a status mentally as to permit of their residing with the more intelligent patients, become temporarily mentally unbalanced and require at such times close supervision and special treatment. Special facilities should be provided for their humane care during the existence of such periods in the way of simply arranged one story structures with proper outfit for hydrotherapy, special diet kitchen and other essentials.

As to the ultimate size of a colony there has been much discussion along both theoretical and practical lines. "One fundamental error in founding many institutions is in making them too small." This statement made by Dr. William P. Spratling many years ago still holds true. A moderate sized colony or village can have available many important features that cost prohibits to the institution which is too small. The epileptic population in the district will naturally regulate to a great extent the ultimate size of the institution. Ordinarily, the institution having capacity for from five hundred to a thousand patients can have a reasonable variety of occupational and recreational activities for therapeutics, can maintain various industries of a value toward lessening the net cost of maintenance, and can provide facilities for satisfactory classification and scientific care and treatment, under the guidance of an executive who can have a close personal and intimate familiarity with the operation of the colony and an acquaintance with its inmates. In an institution with two or three times this population, the superintendent must perforce have a less direct relation to the various phases of institutional activities. As to the economical administration, there is probably nothing gained after an institution

passes a capacity of perhaps a thousand inmates. Another point made by Mr. Letchworth many years ago and which I believe should be borne in mind when new institutions are established is to give the institution a title without inserting in the same the word epileptic. The Craig Colony has this year secured the enactment of legislation restoring its original title, Craig Colony.

The occupations offered the colonists should be most varied. There is no good reason why the epileptic whose mentality is not too low should not, under proper direction, pursue any ordinary avocation barring one which would place him in situations dangerous to him because of his seizures. Work is especially valuable as a means of treatment, as carefully regulated occupations often seem to lessen the number of seizures and prevent mental deterioration. The type of employment should, if possible, prove interesting and in many cases must be of a character different from that pursued previous to admission to the colony.

The most valuable form of labor, both from the viewpoint of treatment and from that of monetary return to the colony, is perhaps out of door work in the garden and on the farm, with their diversified interests, including forestry, breeding and raising of live stock, and other occupations. After that in importance comes the work in shops, household, laundry, and sewing rooms. If sufficient suitable land and equipment are available, there is no good reason why all vegetables and milk required and a considerable portion of meat, eggs, fruit, and other articles of diet cannot be raised on the colony premises. A considerable proportion of repairs and minor improvements can be done, largely by patient labor, and many articles, such as mats, rugs, brushes, brooms, willow baskets and furniture, mattresses, clothing, stockings, caps, hats, and other utensils can be made by the colonists. The making of soap, printing and binding, caning chairs and other activities can easily be carried on. As the institution grows, the industrial work can be progressively developed. Local conditions may permit special industries, for instance, brick and tile making, forestry, butter and cheese making.

The earning capacity of the epileptic, as a class, has been overestimated by many of the general public, and even by some more familiar with their special care. The very word defective should imply that one must not expect a community of defectives to be selfsupporting. Of the total number of epileptics in the average state colony, about fifty per cent. are capable of doing labor of some kind and from ten to fifteen per cent. can perform considerable work when not incapacitated in consequence of seizures. Various games and sports, both indoor and out, should be provided.

Conscientious heads of departments, sympathetic in nature, should be appointed so that it will always be evident that the diversions are therapeutic measures primarily, and for entertainment secondarily, and that industrial departments are for monetary return less than for therapeutic value.

A state institution must perforce expect to provide the common necessities of life without the luxuries which a private, well endowed institution

would be in a position to furnish its inmates. In judging a state institution's standards, this fact must always be foremost in the mind of the examiner. Proper housing, food, clothing, medical and nursing care, sensible hygienic methods as to bathing, recreation, and other activities, with all reasonable opportunities for relatives and friends to visit patients and assignment so far as means permit of compatible patients in each cottage, are demands which should be met. The proper care of inmates should not, however, be based solely on economy. The best care in the proper sense is most economical.

While the *per capita* cost of maintenance must receive careful consideration, nevertheless we must bear in mind that there is a certain irreducible minimal plane which we must keep above if the epileptic is to receive the consistently regulated care and treatment required by one of his makeup. Some nonessentials may be ignored, efforts toward research and investigation may be deferred and hygienic and dietary standards may be modified but cannot be abolished, unless we seek to disregard entirely the purposes for which the special institutions have been established.

The social aspects of epilepsy have in recent years been recognized to a greater extent by the general public than formerly. The difficulty experienced in ordinary homes in giving care to an epileptic relative is such that urgent relief is often demanded. Not only may the epileptic in the family cause much worry to the other members, but such special attention is required by him that another member must remain in the home, who could otherwise add to the family income. Except in families with means, an epileptic having frequent seizures or showing mental change cannot be kept at home indefinitely, but must be placed in an institution when such is available. In the specially arranged institution he is allowed all the liberty which broad consideration of his condition would warrant. He is afforded a more comfortable existence than can ordinarily be obtained outside, removed from an environment where many irritating and annoying stresses are active and placed where, so far as facilities permit, all the upsetting factors are obviated.

The true epileptic, as has been mentioned, has an abnormal makeup, and while he may be fortunate enough to have his convulsions and other seizure phenomena in abeyance, his mannerisms, his reactions to various influences in ordinary environment, can only be changed in part and not entirely removed. His is a receptive state which differs from the nonepileptic, so that disturbing influences acting upon him may bring to light or cause a recurrence of attacks which had been thought to be permanently removed.

Individualization is mandatory for success in treatment. Relief, so far as possible from disturbance from environment, must be secured to make socialization possible, with little or no lowering of the intellectual level. Music, artistic pursuits, re-education, must be made use of for epileptics with sufficient mentality. Mental and physical recreation and rest in proper proportion for the abnormal physical and mental endowment which exists are

required. Entertainments and amusements are primarily part of treatment. All work and no play makes for mental dullness. Recreation, properly arranged, promotes a cheerful atmosphere everywhere, but especially so in an isolated community like a colony. Employees to be retained in the service must also have means of recreation afforded them. If those having to do with the making of appropriations had to live, day in and day out, in an institution for the care of defectives, an always depressing situation, they might be more considerate of requests for funds for establishing means of diversion and recreation as well as for expedience in advancing the general purposes for which the institution was established. One potent reason why we meet with such apathy from those who could help the situation is that they forget the individual in considering the mass.

The average epileptic in a colony can be allowed entire liberty about the premises and various privileges consistent with the mental status of the individual. Serious quarrels or infractions of rules are not more frequent than in an ordinary village of the same population.

The village idea, with varied but harmonious types of architecture, should always be foremost in the development of a colony so that the stamp of the institution may be as much in the background as possible. Preceding the inauguration of the colony development, complete plans as to its ultimate size, arrangements of groups, and other details should be carefully formulated, but these plans should not be so fixed that the benefits of experience cannot be applied as the colony passes through its different stages of growth.

Difficulties encountered by hospitals in obtaining funds for development are common, but often there are special troubles besetting state institutions, owing to lack of sufficient first hand information by the appropriating bodies of actual requirements and the purposes of the particular institution. Plans for progressive development may be delayed for many, many years because of lack of adequate funds.

It has been demonstrated upon investigation made in various parts of the country that a considerable proportion of adult epileptics of better mentality would be able to live fairly well as wage earners, and could accomplish vastly more than the majority of people think possible, if the general public would appreciate the fact that many of them are incapacitated but for brief periods and would make allowance for these interruptions in their conscious life. It has been well said that many of them are obliged to accept work which is not congenial and often far below their capacity and that the length of their service depends more upon infrequency of seizures than it does upon their efficiency or the character of their occupation. Too often the unfortunate epileptic of better mentality is relegated to unskilled labor, even in which capacity he is buffeted about from place to place when his seizures occur. If employers and fellow employees could be made to look upon him in a different manner, be a little patient and sympathetic, one might say human, the problem of adequate provision for many epileptics would be reasonably well solved. There is no doubt

whatever that the epileptic of better mentality who has to maintain himself and often others, has his condition made worse by constantly worrying over the difficulty of obtaining and retaining a position.

For this class, a more numerous one than is ordinarily thought, there is an almost unlimited opportunity of service by those interested in their afflicted fellowmen. Outpatient clinics maintained by special institutions for consultation can accomplish much for them. Every human individual should have the privilege of living under the best possible conditions. It is not only a duty but an obligation of the normal, healthy group to afford reasonable opportunities and assistance to the handicapped to bring this to pass in our great nation.

A salary commensurate with qualifications demanded and suitable living accommodations for members of the resident medical staff should be provided with separate cottages, permitting married officers to live an ordinary family life, tending to attract men of a professional type, interested and inclined to pursue institutional activities as a life specialty. Adequate compensation and proper living accommodations must also be had to insure a nursing and teaching force, equipped to carry out the therapeutics of remedial cases as outlined and directed by the medical staff.

A public institution cannot, with justice, be criticized adversely when it is beyond its power because of inadequate salaries, as well as insufficient living accommodations to attract nurses and attendants who are sympathetic, intelligent and altruistic and with sufficient inherent ability and self-control to meet the stress of institutional employment. Under these circumstances we cannot expect to obtain even an ordinary class of employees. The care of patients, let alone the treatment, cannot be carried out in the manner sought for unless there are available in sufficient numbers nurses and attendants possessing these qualities.

Every institution for epileptics, after it is well established, should have as part of its organization a training school for nurses and attendants. Such a school has many advantages and can do much to elevate the general standard of care of the patients in the institution. In the last analysis the end results and work of an institution for epileptics, the same as for other mentally or physically ill, rests upon a foundation more or less firm, depending upon the quality of its nursing force as it is the members of this particular organization who come in intimate contact with the patients at the colony. Every legitimate means should be exerted to attract to the service of the institution the most efficient individuals to compose its nursing force. While the majority of the graduates of the training school for nurses leave the institution in which they are trained, nevertheless, during the course of training the institution has the benefit of their work.

An institution has to contend with the proposition of preventing, so far as possible, patients leaving without permission. In the open colony system, there is a maximum of liberty for the majority of the patients and occasionally one takes advantage of the privilege extended and departs. Minimal custodial care is the ideal to be sought for in aiming

to effect a satisfactory improvement in the health of the colonist. Not infrequently relatives and friends of the patients are at fault, as they, by their manner or attitude, incite the particular patient to run away. Newly admitted patients at times fail to adapt themselves to their unaccustomed environment. Suffering from nostalgia, they become discontented or dissatisfied because of not finding conditions as represented by relatives or friends who make false or misleading statements to them so as to induce them to come to the institution. With epileptics subject as they are to loss of consciousness and occasionally a wandering impulse, a few leave because of such irresponsible condition, which is temporary in nature.

It is my opinion that all institutions for epileptics should operate under a law which would provide that all of those applicants who are mentally incompetent should be duly committed by law through a proper court, and that those applicants who are of normal mentality should be received as voluntary patients, it being provided that upon short written notice they may leave the institution. It is not an uncommon experience to find many physicians, social workers and poor law officers who cannot recognize the fact that some epileptics are quite normal mentally; they seem to feel that all are in every respect different from ordinary individuals. Every effort should be made to obtain applicants who are normal mentally, or who approach that status. Not only is the outlook for the epileptic of normal mentality quite good if put under proper care at an early period of his disorder, but the care of such a patient is much easier and more pleasant, and adds materially to the encouragement of those working in institutions. This is a feature which should be given consideration as time goes on. Since Craig Colony was first opened for patients, over five thousand have been received, of which number ten per cent. have graded mentally as approximately normal; fifteen per cent. have been found to have undergone a more or less marked mental deterioration from what was apparently originally an average normal mental condition; seventy-five per cent. of the entire number have been primarily mentally defective, exhibiting different grades of feeble-mindedness.

Broad viewpoints of the treatment of the epileptics must embrace not only the question of intrainstitutional but also extrainstitutional care, depending on the various circumstances of the individual epileptic. Every legitimate means of publicity should be employed in communities towards encouraging epileptics and those interested in them to place this class under early proper guidance in an effort to effect such change in their mode of life as may be indicated. Common sense principles should prevail in giving advice as to the general treatment of epilepsy and related conditions. Success can only be obtained from individual treatment founded upon the critical analysis of the epileptic himself. A prescription of sedatives and a few words pertaining to diet and hygiene will accomplish little.

The possibility of social advantages in the way of extension work by institutions for epileptics and following up discharged patients is not given suffi-

cient recognition. All institutions for epileptics should have a sufficiently expansive organization to permit of care being extended along these lines, such work ultimately proving of material value to the various communities thus served. Craig Colony was a pioneer in requesting funds for field workers, but unfortunately, its requests have not thus far borne fruit. In an effort to diffuse information not only by word of mouth but by action, in regard to prophylaxis, social adaptation, support of institution and other important matters so far as epileptics are concerned, too much stress cannot be laid on the necessity for applicants of better mentality being truthfully told the purpose for which they are sent to the state colony. They should not be deceived by pretending they are to be placed in a summer hotel, taken on a pleasure trip, assigned to new employment, or some other falsehood. The failure to properly acquaint the applicant with the reason why he or she should enter the institution naturally causes loss of confidence in relatives and friends and gives rise to suspicion, not only of those persons but also the institution itself, and is a potential source of difficulty in bringing about a readjustment to the new living conditions and the cooperation so essential on the part of the patient is either halfheartedly given or lacking to such a degree as to amount to an antagonistic attitude. I remember reading sometime since a comment by Dr. Copp that, "No institution can accept the fact that it is only a place to live in. It is more than a custodial function. You cannot say 'There is nothing to be done' because the patient is not going to get well."

It has been stated by investigators that about ten per cent. of epileptics seek institutional care because of present conditions. Our efforts should be exerted toward affording care and relief when such is possible to many now uncared for. It should, however, be borne in mind that the majority of epileptics so-called do not require institutional care, nor is it demanded by the community as for the insane whom people fear.

When a benevolent public and well disposed legislators can once forget the existing erroneous idea of epilepsy and look on it as an illness which is likely to attack their nearest and dearest of any age, and at any time, we hope in our own state at least, when the financial crisis passes and things assume a more normal aspect, they will awake and wonder and reproach themselves for their neglect toward this class of patients, making amends by supplying the places so sadly needed.

When the condition of the respective states warrants, I would urge an energetic campaign to provide colony care or proper supervision for a much larger number of the great group of epileptics with little mental defect in whom there is promise of improvement and who are now unable for one reason or another to obtain the continued advice they so much need. All agencies interested must cooperate if success is to be had. New York should further develop Craig Colony and ultimately establish another colony near Greater New York.

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A COMPARATIVE STUDY OF THE PHENOMENA OF EPILEPSY.*

With the Actions of Normal Man.

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The spirit of the day is one of intense eagerness to build anew. The medical profession has taken part in the world's militant conflict which brought about the destruction of institutions that had ceased to insure progress and growth. But as order and purpose must always govern mankind, we now look for the signs of new laws and principles, growing out of the ruins of war, which shall make for a higher state of civilization. This is what is taking place throughout the world today and what is true of the social organism as a whole we must expect of its parts. The stimulus for this new growth in medicine is felt when we review the progress made in this field during the war. We point with pride to important advances made, under army influences, in surgical measures, and to new discoveries in immunology; to increased efficiency in methods of diagnosis and to standardization in röntgenological technic. Truly a new foundation has been laid out of the materials of destruction for a greater development in the science of medicine.

But this vast medical force, having been released from the paternalistic control of the army by demobilization, now faces, upon its own resources, the problems of readjustment. Although there is a general hope and confidence for better things, not a few men view with alarm our present status. Such a position can be held only by men who lack proper perspective. In our own particular field—the study of the phenomena of epilepsy—we find example of this narrowness of vision in those who cry that nothing but conflicting views are presented concerning the cause and treatment of epilepsy; that nothing but a confusion of ideas exists in what is said or done to help the epileptic. Such men are wont to say that alcohol as a causative factor in epilepsy is overrated and that all who suffer from epilepsy do not show a taint in their family history. They believe that the psychogenic theory of the cause of epilepsy is a bursting bubble and that feeble facts marshalled against the pituitary gland have greatly increased the consumption of pituitary extract. They feel that surgical measures of whatever kind performed on the epileptic are ill advised and indiscriminate, whether it be on the colon to alleviate intestinal stasis or on the skull to relieve intracranial pressure; and that eye strain as a cause of epilepsy cannot be held as important until some institution can prove conclusively that there is such a thing as an epileptic eye. They are able to offer only unfavorable criticism as a reward to the workers of the past.

Knowing then that in past experience is found the elements of truth upon which progress is made, we cannot wholly disregard any particular line of investigation that has been made in the study of epilepsy. Though we realize, perhaps, that we can

utilize but little of the information thus obtained, we are compelled to examine in detail material that often seems irrelevant. Our reason for wanting to know something of the family history, something of the health or sickness of brothers and sisters, of father and mother and other close relatives, then becomes apparent. We see why it is important to know something of their mental calibre, of their temperament as to industriousness, of family traits, of tendencies to nervousness—in sickness or in health—of insanity, feeble-mindedness or epilepsy, peculiarities as to eccentricities, mannerisms, geniuses or cranks, of immorality, sexual or criminalistic tendencies, of chronic disease, including syphilis, tuberculosis, cancer, alcoholism or drug addiction. All of these are important as well as any other condition of disorder the family may manifest.

In the personal history of the patient, also, we spare no effort in our examination of details. Factors bearing on the prenatal history of the patient are not without importance in the disorder of epilepsy. We want to know in particular something of the general condition of the father and mother at the time of conception of the patient—were they healthy—were they intoxicated—what was their mental state at the time—was the child desired or was it an accidental conception—was there an attempt at the time or afterward to interrupt the pregnancy? It is important to know how many induced abortions and how many which were without intervention; the condition of the mother's health, both mental and physical, during the pregnancy; whether or not at this time she was sick or received an injury.

In the postnatal history we should know something of the health of the patient at birth and during the nursing period; something of his mental and physical characteristics up to the school age, and in particular his temperament; as to whether or not he had crying spells, fits of anger, or a tendency toward whims, and whether or not he had broad interests in play. In his school history we should know whether or not he was normal, slow or precocious in his studies. Whether or not he took well with playmates and possessed lots of friends; were broad interests developed, and the nature of them.

When we take up the immediate complaint of the patient, it is interesting to know the patient's and family's assigned cause of the disorder; the character of seizures and the duration of the affliction; the disposition of the patient previous to the onset of the affliction and before and after seizures.

The physical examination should be thorough and complete; any physical defect on inspection, palpation, percussion and auscultation, should be noted. This should include complete laboratory tests of the urine and blood, with x ray findings of the head, chest and alimentary tract. This of course includes a complete neurological examination, localizing as far as possible the seat and type of lesion discovered. In doing this, all reflexes should be tested, including the pupillary, abdominal, knee, and others; sensation, tactile and deep muscle sense; station, cerebellar by the Romberg; tremors of the eyes, mouth, face and fingers; speech by test phrases.

The mental examination should be as complete

*Read before the National Association for the Study of Epilepsy at the New York Academy of Medicine, June 3, 1920.

as we can make it. In this, the mental age of the patient should be determined, as by the Simon-Binet test, for example. His emotional life should be viewed as manifested at different periods in his life, showing particular and general interests in surrounding affairs, noting especially his temperament under conditions of stress and under favorable circumstances, with special emphasis of any manifestations of a lack or poverty of emotional interests. It is particularly important to note how the patient sleeps, if well and how long, whether or not it is shallow, restless, or with a tendency to dream and the nature of the dreams. The mental examination should include an observation of the patient's powers of perception, noting illusions, hallucinations and delusions, either admitted, elicited or indicated; his powers of consciousness, whether clear or befogged; of attention, whether normal or distractable; of memory, whether it is good for recent as well as remote events; of orientation as to time, place and person; his train of thought, whether it shows retardation or a flight of ideas; his power of judgment, rational or delusional; if the latter, whether of persecution, fears, selfaccusation or of grandiose ideas; his judgment as to the value of things; and his general conduct at play or at work, at home or in an institution, without restraint or under close guard.

In a general way this is the nature of a proper examination of our patient. The rehashing of these points no doubt has been tiresome. It has not been my purpose, however, to put myself in a position to say what method should constitute a proper examination. My purpose is rather to emphasize the importance of a careful examination of the patient. Through such an examination, we are able to discover not only any process of disease or mental disorder which our patient may have, but we come into possession of knowledge which helps us to understand more fully the factors at work which produce a convulsion and tend to its repetition. We are able to pick up those elements of truths from these various sources of investigation once supposed to explain the phenomena of epilepsy and putting them together we are able not only to see their particular application, but we are able to draw conclusions from them which throw a better light on our problem.

In the past we were wont to look upon epilepsy as an entity in itself, just as we now view syphilis, typhoid or cancer. From such a viewpoint, the bacteriologist hoped to find a germ as the causative agent. But no infectious organism is found which produces the disorder. From a similar position the pathologist with untiring toil labored to discover some gross lesion which would account for the condition. But no pathological condition is known that is common to all so afflicted. In a similar manner the clinician has failed to establish such theories as endocrinological disturbance, acidosis or increased intracranial pressure. The psychiatrist, by a classification of abnormal mental symptoms as seen in the epileptic, points to a generalized instability of the cortical centres and to an inherited nervous tendency. A more recent classification presents a very careful study of the mental symptoms of the

epileptic, from which a conclusion is drawn that there is an epileptic type, a person with a peculiar but definite mental makeup, which, when present, constitutes a potential epileptic character that goes the epileptic way when a certain type of stress is encountered. Unfavorable criticism is not to be passed upon any of these theories for it is work of a constructive nature which guides us in the care and treatment of our patient.

We cannot, however, in our study of the phenomena of epilepsy, view it from any particular angle alone. We must strike a deeper level than that where mental symptoms are classified or where epilepsy, spoken of in the plural as the epilepsies, is classified according to known or unknown symptoms. We must do more than classify. Our problem leads us to a point of broader perspective where processes of physical and mental disease may be observed in their proper relation in the disorder. We must see that both physical disease and abnormal mental processes produce activity of a particular character and that the whole phenomena of a partial or entire loss of consciousness, with or without convulsions, can be explained only in terms of action of a definite type.

Bodily activity of all kinds is dependent upon mental states of which we may or may not at the time be aware. These mental states are purposeful in their operation for they act as the motive force behind our actions. When they find expression in a normal manner, they tend to secure for us our general good fortune. Should they find expression in an abnormal manner, however, and be habitually exercised in this way they may lead to the possessor's destruction.

The phenomena of epilepsy is an example of an habitual abnormal expression of mental activity. The epileptic, when he meets unsurmountable difficulties, is beset with mental states over which he has no control. Everything which emphasizes the futility of his efforts serves all the more to increase his emotional drive until the higher brain centres, which have to do with the directing and the consciousness of efforts, are exhausted from overwork because of this extreme nervous tension. This exhaustion means a cessation of function until a period of rest intervenes. So the patient suffers, according to the degree of fatigue or exhaustion which exists, a partial or complete loss of consciousness. This is not deep enough to involve the motor centres, so the emotion goes on to expression in muscular activity partially or wholly unguided and undirected, which we know as a convulsive seizure. When this becomes the patient's habitual channel of outlet for strong emotional states, we denote the condition as epilepsy.

The factors which tend to produce these strong mental states, while numerous and varied, are cryptogenic in their nature. By a classification of the mental symptoms as seen in the epileptic, some workers have thought that they could account for the disorder on the basis of an instability of the cortical centres of the brain. From a similar reasoning we have heard of the term psychogenic epilepsy. Such a conception is confusing and misleading, for mental states, as such, which cause us to act, come

only as things attract or excite us and they come from without and not from within the brain itself.

The manner in which we react to these things which draw our attention is dependent largely upon our general attitude toward things about us. A normal man has always cultivated broad interests in the things of life so that when he is confronted with an experience of an unpleasant nature, he is able to escape it by entertaining more pleasant thoughts, that are ever striving for recognition in his mind. Such conflicting thoughts tend to weaken strong emotional states. The epileptic, however, is not of this temperament. He gradually drifts into a life of restriction through an intensive application of his energy to particular instead of broad interests.

The tendency of the epileptic toward a poverty of interests in life is one largely of circumstances over which he has but little control. Such persons, it is true, are often endowed with family traits of nervousness, manifested usually in overindustriousness; yet misfortunes of some kind in which there are blighted hopes can usually be found which lead them into a life of restricted pursuits. Sickness, sin and poverty have been said to be three of the greatest scourges of society, which lead to untold misery and suffering. They work hand in hand, often as a vicious circle, reducing the possibilities of pleasurable activities of every individual touched by them. These conditions, as manifested in the epileptic, do not point so much, then, to an individual endowed primarily with inherited mental stigmata as they do to the handicap society places before him as he seeks good fortune.

The following case histories are presented to show the processes at work which produce thwarted ambitions, narrowing of life interests and an epileptic reaction as a result of strong emotional states of mind:

Case I.—751—Patient O. A. S.—Male, aged forty-one, divorced, admitted December 19, 1919. First epileptic attack at age of thirty-two. Infrequent at first, but later occurring about once a month, at which time he had three or four severe spells. Patient gave a history of several convulsions at the age of two years, when he suffered much from colic and indigestion. The patient's family history was negative for chronic or mental disease of any kind. Physical examination of the patient was negative except for partial atrophy of both testicles which followed as a complication of mumps at the age of fourteen. Mentally the patient seemed normal, except that he was of a nervous and restless disposition. He was very industrious and headstrong at times. While he was ever ready to carry on a general conversation, it was impossible to get him to talk of his own life.

The following information was obtained from his sister, who visited him at the institution: She related that as a boy he was exemplary in his habits and not different from his associates. At the age of twenty he was married to a beautiful girl, a woman ideal in character and disposition. They lived prosperously and happily on a farm in Indiana for eight years, but no children were born to them. At the end of this time, upon the solicitation of his wife,

who wished to live near her brother, they moved to Oregon. Shortly after a year had passed the patient suddenly appeared at his mother's home in Indiana. He was found walking back and forth in the back yard of her home. Upon being asked what he was doing back home, he remarked that he had stayed away from his mother as long as possible. His mother and sister, noting that his visit was rather an extended one, persuaded him to have his wife return. After six months she came back. Five months later she gave birth to a baby boy. Nothing was said to either the wife or patient and no trouble arose between them. Shortly afterward, they returned to Oregon. A year later the patient suffered his first epileptic attack.

Having given me this information, the sister warned me not to mention this to her brother, saying that he became raving mad when the subject was mentioned. Thinking that the patient would be benefited by an explanation of the factors at work in his disorder, her admonition was disregarded. Almost at the first word, the patient was aware of the nature of my interview. He became violent in his manner of speech, censuring me in vigorous terms for bringing up unpleasant memories which he so earnestly attempted to keep from his mind. After his anger was spent, an attempt was made to have him understand that he could not expect to bear his troubles alone in silence and that with a better insight into the workings of his mind, he probably could be helped to avoid his silent brooding which had much to do with his seizures. He sat in silence, but before many words were said, he fell unconscious in a convulsion. The syndrome of physical disease and permanent disability, marriage and thwarted ambition because of this disability, the invasion of his home, the sin of his wife and all that went with it, and finally the bearing of his unpleasant experience without visible complaint until the break came, is interesting material for speculation.

Case II.—525—E. S., male, aged forty-eight, married; admitted October 16, 1916. Seizures, grand mal in type; patient often irritable before a period of seizures, which come at about three weeks' intervals or oftener, and disturbed a few days following. During disturbed spells he had illusions of things crawling about him; "wants to settle the thing; put over the deal in first class order." At such times he had a tendency toward violence and destructiveness.

The family history was negative. Patient had three healthy, grown children. The personal history showed that the patient had always been healthy except for scrofula at six years of age, which was said to have been very severe. Patient showed no present signs or symptoms of this condition. Physical examination on entrance to the institution negative. The patient was a robust man with no apparent physical defects. Blood and spinal fluid repeatedly negative. Mental examination during the intervals between seizures showed that the patient had no marked mental deterioration. He was very industrious and capable. He was able to direct other patients in their work, but was prone to use force when his leadership was questioned.

Careful inquiry regarding the patient's past history brought out these interesting facts. As a boy, his school days were limited. Most of his time was spent in his father's mill, where he did more than a man's work. He never had a vacation, never had time off, but, as he himself said, "always had his head to the grindstone." His married life, although happy, stimulated him to increased efforts, more especially when it became necessary to provide for his children. He became a man of means, yet he never gained the wealth he desired for his family. In late years he became farmer, merchant and automobile salesman, so eager was he to accumulate money. He has often said that he never could stand to fail in selling an automobile. In fact, he stated that he never gave up until a deal was made.

While at the institution his main desire was to get back home to his family. When it was explained that he must get his mind off this subject if he ever expected to get home, he agreed to try to do so. He succeeded for a time in keeping unpleasant thoughts away by employing his mind in work at hand. He went over two months without a seizure, when one Sunday evening he suffered an attack. The next morning he admitted that he had been thinking* about his family, but stoutly maintained that he had not let his thoughts get to the point of unpleasantness or worry. He explained that he had been sitting on a bench in the yard watching the road. As each automobile approached he would say to himself: "That's my wife and children coming for me." When they passed by, however, he urgently maintained that he did not worry about it, but watched for the next machine in order to repeat the same process. He was quite surprised when he was told that the whole experience was an unpleasant one; that, to be a pleasant one, the machine would have to turn in, bringing his wife and children; that to watch each car with a desire in his mind was building up hope after hope, with the greatest suspense which is always unpleasant until the desire is satisfied. The patient was never able to stop worrying about his family. With a broad smile on his face he was ever ready to say, "Doctor, I believe that we ought to be able to get together in an agreement whereby I can get home for a while at least." He died recently in an epileptic seizure.

We might go on indefinitely reciting, from case histories, the influences at work in the disorder of epilepsy which limit the patient's field of pleasurable activity, for they are infinite in number. Each case manifests them in its own peculiar manner. But, aside from mental complexes, the stigmata of disease plays a strong part in this way. Syphilis probably is one of the greatest. Between twenty-five and thirty per cent. of our patients show a positive blood Wassermann, all of which, except a very small proportion, is congenital in type. The body as a living organism resents such infringement upon its welfare and when consciousness is impaired, a convulsion is one of the forms of resentment.

It is difficult to say just to what extent the toxins of syphilis and other diseases, or exogenous and endogenous toxins of whatever source, affect the

conscious centres of the brain. The greatest apparent damage results, however, from permanent disablement, which is an end result of processes of disease. The hemiplegic patient, for example, is prevented from entering into normal pleasurable activity because of his affliction. If he is energetic, he becomes the victim of thwarted ambitions. He comes not only to a full realization of his physical and mental handicap resulting from the inroads of disease, but he is made to feel that he is different from normal people and consequently is no longer able to associate with them on an equal footing. His life from this time becomes one of isolation in spite of his efforts to prevent it. If he persists in his attempts to take part in the activities of those about him, he becomes an object of ridicule and abuse. Denied desired pleasurable pursuits and being handicapped because of a restriction of outside interests, the patient tends, when obstacles on every hand confront him, to become explosive in character. In the face of unsurmountable difficulties, which serve only to increase strong emotional states of mind, the epileptic reaction comes as a complete breakdown to physical and mental effort.

Examining the disorder of epilepsy from this point of view, we come into possession of definite principles applicable in the care and treatment of our patient. These principles have long been understood by those experienced in handling the epileptic, but the general practitioner and surgeon have often been the victims of advice of doubtful value. When in this light we come into a full realization of the meaning of the phenomena of epilepsy, we see in our patient a person who may be afflicted, not different from any other person, with a surgical or diseased condition. Disease processes are then combatted, not with the hope of curing epilepsy, but because the patient is sick. Surgical procedure is instituted when the patient has a surgical condition and not to stop epileptic attacks.

We treat the patient, and not a disorder. Our patients, for example, may have syphilis, which has much to do, as we have seen, as a causative agent in the production of seizures, yet we do not hope to cure epilepsy by arresting syphilitic processes. We may, by treatment, produce a negative blood and spinal-fluid. We may also place a patient in such an environment that he may be helped to avoid strong emotional states of mind and therefore have his seizures temporarily or permanently controlled. Perhaps even then our prognosis can be no greater than is offered in other processes of disease. The army ruling held that malaria is never cured, but only arrested. Syphilis, once thought to be completely driven from the human body by salvarsan and mercury, is now thought to be arrested only and not cured. Epilepsy no doubt will be considered in this way. Our hopes then in controlling the disorder will be similar to those in diseases of all kinds. Understanding the phenomena, we shall expect only to arrest and not cure the disorder. The future problem will engage our efforts in the prevention of epilepsy just as the supreme purpose of the medical profession is to prevent disease.

In conclusion, then, it may be said that constructive thought is fostered today in every human interest. The ideas set forth in this brief space are intended only in this spirit and the views presented make no assertion to any sort of completeness. They aim at stimulating thought and challenging discussion, for it is only by exposing our own and correcting each other's errors that thought is advanced. Likewise, originality is not claimed in all that is said here, for we build only upon the materials of past experience. Perhaps when all is known about the phenomena here considered, some one will come forth with a review of the literature, giving everyone due credit for the part which they have played in the work. At the present, as we gather from all the sources possible, the beginnings of knowledge on the subject, we can but strive to see it in its proper relation. In this light, epilepsy is considered here as an abnormal muscular expression of strong mental states. It is a particular type of reaction which occurs when purposeful efforts of mind and body come to defeat. It is seen in an individual who, possessing a poverty of interests in his environment, cannot, as the normal man does, escape strong emotional feeling by entertaining conflicting thoughts which weaken strong mental states.

MENTALITY IN EPILEPSY.*

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However clear, however familiar to even the casual observer, are the grosser symptoms of those manifestations which we call epilepsy, the causes, the pathology, and even the more detailed symptomatology, are so vague and so shrouded in mystery that he who ever writes upon the subject must needs be either very brave or, perhaps, sometimes only foolish. However, even in this day of specialization, epileptics are, in the main, observed and cared for by general practitioners, and it may not be inapt for one who represents in some degree the unspecialized mind to bring before you briefly observations of a few simple things which help the less skilled in the study and care of the epileptic.

Looking back over the writings of the past three or four generations we find a fairly clear, if wholly arbitrary, distinction made between nervous disease and mental disease. Even though the present day neurologist has allowed the psychiatrist to purloin some of his neurasthenics, and the psychiatrist has been forced to accept epileptics, provided, of course, their epilepsy was with psychoses, the nervous and the mental classifications remain apart, as separate and distinct.

To the casual observer the nervous symptoms of epilepsy have been so manifest that it is not strange that writers have uniformly classed this disorder with the nervous diseases. Without regard to its technical accuracy, this classification has given to the student and to the general observer the tendency to pay more particular attention to the somatic and

nervous manifestations than to the less apparent, if none the less definite, mental picture. From the earliest days there has been recognition of the grosser effects of this disease on the mind. In ancient times it was called the sacred disease, "Because it affects the Mind, the most noble and sacred Part of a rational Creature" (1). To this terminology Hippocrates took exception, and of those who called it the sacred disease he said, "Such persons, then, using the divinity as a pretext and screen of their own inability to afford any assistance, have given out that the disease is sacred, adding suitable reasons for this opinion, they have instituted a mode of treatment which is safe for themselves, namely, by applying purifications and incantations, and enforcing abstinence from baths and many articles of food which are unwholesome to men in diseases. . . . All these they enjoin with references to its divinity, as if possessed of more knowledge, and announcing before other pretents, so that if the person should recover, theirs would be the honor and credit; and if he should die, they would have a certain defense, as if the gods, and not they, were to blame." (2). In the fifth century Cælius Aurelianus wrote a masterful description of the physical characteristics of epilepsy, and added, "The Mind is anxious and uneasy, prone to anger on the slightest occasions, . . . forgetful of circumstances almost immediately before transacted, and ready to be clouded and overcast with the impressions of gloom and melancholy" (3). Nearly two centuries ago an English writer opened a dissertation on epilepsy with this sentence: "Among the several Calamities to which human Nature is subjected, none is more justly formidable, than that universal and involuntary concussion, and violent Agitation, of the external Parts, which is accompanied with a Suspension both of the external and internal Senses, and which we commonly call an Epilepsy; for, during the Shocks of this terrible Misfortune, the body is not only variously distorted and deform'd, but also the Mind, as it were, unhing'd, and deprived of its genuine Powers" (4). So, wherever we turn in literature, descriptions of the epileptic contain references to the effect of the disease upon the mind.

As an important factor in the causation of the epileptic attack mental influence received early attention. After advising that patients suffering from epileptic convulsions "abstain from food one day in four," Celsus, writing in the first century, says: "Intense thoughtfulness, or fatigue of mind, is also to be guarded against . . . for application of mind is not safe for those who are subject to this disorder." In the second century Galen made similar comment, citing the case of a schoolmaster; and an old but more recent writer said: "But, above all things, every occasion of terror, dread, or anger, is to be carefully avoided; because these have a strong tendency to bring on the paroxysms" (5). In all of these early comments the question of mental influence receives little attention except in relation to the individual convulsion, though many writers, from Cælius Aurelianus down, including Esquirol, Jules Falret and Trousseau, came hopefully near to drawing a picture of the basic epileptic

*Read before the National Association for the Study of Epilepsy, New York, June 3, 1920.

mentality. In 1861 Jules Falret wrote: "The intellectual disorders observed in epileptics may be divided into three principal categories: First, those which, manifesting themselves in the intervals between the attacks, are independent of these, and constitute the habitual mental state of epileptics; second, those which occur temporarily before, during or after the attack, and may be considered as epiphenomena of the attack itself; third, and last, intellectual disorders, more or less prolonged, which coming on in paroxysms, either directly connected with the convulsive or vertiginous phenomena, or occurring independently of these, specially deserve the name of epileptic insanity." Again, when we compare the basic epileptic mentality with that of simple developmental inferiority, this writer helps us in the establishment of a differentiation, mentioning particularly the high degree of capability to which the epileptic mind will at times rise, as shown by well known historical characters.

Perhaps it was only suggestions of history which led Dr. Ireland in his series of charming psychological biographies to dwell upon the epileptic mentality as attributed to Cæsar, Mahomet, Napoleon, and others. Some of us, however, prefer to believe that his long association with the developmentally subnormal and the epileptic had bred in him consciousness of the existence of a distinct type of mentality in the epileptic, and that his recognition in these historical characters of an often diminished repressive function and a moral obliquity to consequences furnished a basis to his diagnoses.

Two years ago, Dr. L. Pierce Clark said: ". . . Given a certain potential constitution plus a special type of stress applied to it, we gain a certain psychological effect which we have called the epileptic reaction. . . . The epileptic constitution has long been recognized as the enduring mental stigma of essential epilepsy itself. Only recently have studies disclosed that the main tenets of such a character are present years before the nervous disorder of epilepsy is shown in fits. . . . A disintegration of habits and character, known as deterioration, occurs more easily in one thus handicapped by a defective endowment. Therefore, mental or behavior deterioration often precedes actual epileptic seizures for a considerable time. . . . Any effective plan of treatment must essentially take strict and early account of the makeup of epileptics, before all else" (7).

That epilepsy, or for that matter any other disorder which profoundly affects the neurological, the psychological and the sociological life of the individual, usually induces pronounced mental involution, is recognized. It has been remarked that "Epilepsy and feeble-mindedness show a great similarity in their hereditary reactions and both appear to be due to a defect of the germ plasm, that is, they are both recessives" (8). In the true case of feeble-mindedness we expect change to be limited to a single direction, regression. On the other hand, we meet epileptics whose mentality shows what we may regard as the psychic epileptic characteristic, and we find, under wise direction and treatment, these patients showing improvement in mental condition and adaptability. In other words, in the

epileptic mind we find two more or less distinct types of subnormality. The one is relatively obvious, occurring particularly in the epileptic of long standing, a resultant condition fraught with hopelessness. The other is more vague, representing a basic state which may long antedate the appearance of the grosser symptoms, or may even exist throughout life without the accompaniment of convulsions or other somatic disturbances, and which is not necessarily progressive.

Of epilepsy we are told that it is "worth while to consider the attack as due to a faulty distribution of energy which may be brought about in many ways and through divers mechanisms" (9). However we regard the ailment, whether as a disease, a symptom, complex, or what not, we must recognize one fact: Its symptoms are strikingly definite. Physically, few diseases exhibit a clearer or more constant line of symptoms. To some of us the mental picture seems no less determinate. The deductions of logic do not lead us to expect definite results from various and indefinite causes. However much we may be impressed by the variousness of influences which may promote the development of epilepsy, he who asserts that the disease is not an entity will do well to guard his declaration with qualifications. If we have a basic mental condition essential to the development of epilepsy, whatever influence tends to better that condition must in great measure help in combating the general epileptic state.

Some of us have come to the idea of basing our prognoses on the mental state, and to gauge progress by mental change. In children we even go so far as to base our estimate in part on the psychology of the child's adult associates and mentors. We impress upon the child and upon the parents the necessity of developing the cheerful viewpoint, of avoiding displays of temper, the sulks and the general spirit of contrariness. To the parents of the child and to the adult or near adult epileptic we give a matter of fact explanation of the seriousness of the disease, and we tell them that a patient entering upon a course of treatment is like the acolyte who seeks entrance to a monkish order. Trials and tribulations and selfdenials will be his, and they must be met with fortitude and with cheerfulness. To each epileptic we give a life purpose, the purpose of overcoming his disease. Without effort to eliminate individual mental conflicts, the effort is made to develop a poise which makes conflicts unlikely.

It is interesting to note that in an epileptic whose acute attacks are fairly well controlled by a given dose of bromide or other sedative drug, consistent mental therapy permits equally good results with a much reduced dose of medicine. Moreover, when so administered the use of bromides is not accompanied by increased mental dulling, but oftentimes by a distinct gain in mental acuity. In prognosis it is much safer to base predictions upon this mental change than upon the exact numbers or character of the fits. Though the administration of the bromides to these patients has been strongly criticized, few now deny their usefulness. Let me predict that the time will be when the place of mental

therapy in the treatment of such patients will be as firmly established.

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123 WEST FIFTH STREET.

EPILEPSY TREATED WITH LUMINAL.*

Preliminary Report of Twenty-two Cases.

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The treatment of epilepsy has always been most unsatisfactory. Each year we see new drugs and new combinations being introduced as curealls for the relief of convulsions and as each of them is gradually discarded we again turn to the bromides, meanwhile continuing to look for something better, more satisfactory and with less bad effects. Before the war a new product, luminal, appeared on the market. This was used at the Monson State Hospital during part of 1913 and 1914 after which it could not be obtained. Since then it has again appeared and various assertions have been made for its use, particularly in epilepsy.

CLASS OF DRUG AND DOSE.

Luminal, known chemically as phenylethylmalonylurea, belongs to the same class of drugs as veronal, trional and barbital—the so-called ethylated compounds. It was first made in Germany but recently has been made in this country. It is made in two forms, tablet and powder. In epilepsy the dose varies from three quarters to one and a half grains twice daily in tablet form although the powder form, luminal sodium, may be used subcutaneously, five to ten grains in freshly prepared solution. The assertions made for luminal vary. According to the manufacturers it possesses a pronounced sedative and antispasmodic action in epilepsy even in small doses and according to a prominent authority, acts virtually as a specific in some cases. Bad effects are practically absent when given in customary doses.

Dercum (1) reports that in epilepsy even when most confirmed, the drug exercises a remarkable control over the seizures. "The latter were usually promptly inhibited altogether." Also that the drug seemed to exercise more control over the group of so-called essential epilepsies. "Indeed in some instances the drug acted virtually as a specific."

My own rather brief observation with luminal covers a period of three months, February, March and April of 1920. During this time I have administered the drug to twenty-two patients, no other medicine being used except an occasional laxative.

Seven of my patients were of the idiopathic type, five were patients in whom the petit mal seizures predominated, two were status patients and the remaining eight patients were those in whom there was an equal distribution of grand mal and petit mal seizures. The method of administration has been one and a half grains in tablet form twice daily, night and morning.

Among the first symptoms noted following its use was the constant and almost universal complaint of sleepiness and drowsiness. These later developed into various symptoms resembling those of bromism—dizziness, depression, mental apathy, confusion, memory defects, hallucinations and delusions—practically all of the bad effects of bromides were observed with the exception of the rash. At the end of two weeks the drug was reduced one half in seven patients who showed the more marked symptoms of bromism, but the symptoms persisted, although with less severity. In two cases it was necessary to withdraw the drug entirely at the end of one month on account of the development of severe mental symptoms.

The most marked effect of the drug was noted in the decrease in the number of convulsions. This effect was noticeable the second and third days following its administration. There was a decrease in the number of convulsions in every case with the exception of two in which there was an increase. The seizures were greatly reduced even in the two cases in which the drug was entirely withdrawn after a month.

The number of convulsions during the three months while taking luminal was—first month 199, second month 143, third month 141, a total of 483 and an average per month of 161 or 7.31 per patient per month. For three months previous to luminal administration there was a monthly average of 532 convulsions or 24.18 per patient per month. These figures are based on three month periods and indicate a reduction of seventy per cent. in the number of convulsions while taking the drug. The monthly average for one year previous to luminal administration was 476 as compared to 161 convulsions while taking luminal, showing a reduction in number of sixty-six per cent. in all classes, which seems to be the more accurate percentage of reduction.

The lessening in the number of convulsions was most marked in the idiopathic cases, the percentage varying from twenty-two to one hundred per cent. There was also marked reduction in the petit mal cases except in one instance in which there was a very high increase of 330 per cent. In one other case there was an increase of 108 per cent. in about an equal distribution of grand mal and petit mal seizures. In the two status cases there were no attacks of status during the three months, but the patients did have an occasional grand mal convulsion.

The smaller doses seemed to have practically the same effect on the control of seizures as the larger. There was no appreciable change observed by me in the weights of the patients, little or no change in blood pressure, temperature or respiration. The mentality did not seem to improve under its use as in only one case was there improvement mentally.

*Read before the National Association for the Study of Epilepsy. New York Academy of Medicine, June 3, 1920.

UNTOWARD EFFECTS.

The manufacturers assert that under the use of customary doses bad effects are practically absent. Dercum states that he observed at no time the slightest deleterious or untoward effects on the mental life of the patient—"nothing indeed save the cessation of the attacks." Farnell (2) reported two cases in which there were toxic effects, both patients showing speech disturbances, slurring, scanning and parasphasic. Ataxia was marked in both cases. In one there was tendency to drop foot and the knee reflexes were absent. The dose employed was from five to ten grains.

Symptoms of bromism were present in the majority of my patients, but in only two would I consider the effect toxic. One patient began to show untoward symptoms from the first, had periods of crying and confusion which later developed into delusions of persecution. Finally she threatened bodily harm to anyone who came near her and it was necessary to watch her closely. The luminal was reduced one half without any change in her mental condition and at the end of a month was discontinued entirely.

In the other patient there were hallucinations, both auditory and visual, later crawling on the floor, climbing the doors and windows, appeared unsteady in gait, would disrobe frequently and remain in a nude condition unless constantly watched. The drug was discontinued after a month as she became more confused. She was in this mental state eighteen days out of the thirty during its administration. After having five seizures she became more rational.

The first patient had no convulsions during luminal administration and the second patient showed a decided decrease in the number of convulsions. I believe I would have had a higher percentage of toxic effects had the drug not been reduced in seven cases. Its effect should be watched carefully as its administration is not unattended with untoward symptoms.

WITHDRAWAL SYMPTOMS.

Immediately following the withdrawal of luminal there was a large increase in the number of convulsions in practically every case. As is true in all drugs that have a tendency to control convulsions, once the drug is discontinued the number of seizures rapidly increases. Seventeen of the twenty-two patients had convulsions within the first ten days, three of them being in bed for one week. The two status patients had severe attacks of status within fifteen days. There was an average of 32.64 convulsions per patient per month following its withdrawal as compared to 24.18 previous to taking the drug and 7.31 convulsions per patient while taking luminal, showing that the epileptic habit returns seemingly with increased vigor following its withdrawal. No other withdrawal symptoms were noted as the use of the drug appeared to be unattended by pleasant or euphoric sensations.

CONCLUSIONS.

Cures are not to be expected. It is at best a palliative remedy. It is not virtually a specific.

It reduces the total number of convulsions in all classes sixty-six per cent. although a small proportion

of patients have an increased number of convulsions during its use. It has practically no effect upon some patients, and about ten per cent. show untoward symptoms from its use.

It has all the bad effects of bromides with the exception of the rash.

The drug must be used over a long period of time and continually, as once its administration is discontinued the epileptic habit returns with increased severity.

Undoubtedly luminal serves a field in the therapeutics of epilepsy. It is worth a trial in every case but to determine its relative value it will be necessary to use it in a great number of cases and over a long period of time.

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PRACTICAL EXPERIENCE IN THE
TRAINING TREATMENT OF
EPILEPTICS.*

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This paper contains data taken from notes obtained in a careful study of a series of cases of essential epilepsy, ranging in age from ten to fifty years and covering a period of ten years' duration. During this period of observation, the general plan as regards physical treatment, changed but little. At first the attention was centred upon the possibility of some physical defect being responsible for the attack. Extensive x ray examinations were made of the head, the stomach and intestinal tract. The blood and spinal fluid in each case were carefully examined and a daily analysis of urine made until all signs of intestinal putrefaction had disappeared. Special attention was given to the correction of poor digestion, constipation and faulty circulation and a proper diet administered at all times, but as the physical defects were relieved and the attacks continued, more attention was paid to assisting the patients to adjust and adapt themselves to the simple environment the club life offered, for the patients were housed in a simple homelike residence in the country which we called The Club. It had been evident from the beginning that all the patients, without exception, showed periodic states of annoyance, irritation and lethargies in various degrees of severity according to their character makeup, and it was further noted that such states always terminated in a climax of one or more attacks.

All patients gave a history of sedative treatment before coming under observation and all showed a general tendency to sluggish circulation and low blood pressure. They were constipated and had mucocolitis in various stages. All the sedatives were stopped soon after the beginning of treatment.

*Read before the National Association for the study of Epilepsy, New York Academy of Medicine, June 3, 1920. The case material used in this paper was obtained while assisting Dr. L. Pierce Clark in his private service.

Colon irrigations were given at frequent intervals until the colitis disappeared. A daily routine was prescribed for each patient that involved more or less physical activity, such as walking, gardening, tennis, baseball and shop work. Under this careful training all the patients soon began to take on a healthy appearance. Their skin became clear, the expression bright, they were more alert and the muscles were firm. The constipation and colitis were corrected; the poor digestion returned to normal; the sluggish circulation improved and to all appearances these patients were as perfect physically as medical science could make them, but nevertheless their attacks continued with the same degree of force and frequency. It was noted, however, that as they gained in physical strength, their attacks did not seem to produce as much fatigue, and they recovered more quickly.

The one dominating factor that remained unchanged was the attitude of the patients toward their environment. This was characterized by a rather passive, indifferent state as regards routine work. If they did display a normal reaction to their environment, it was short lived and what they accomplished was but little compared to the time and energy expended. They performed their daily tasks in a mechanical sort of way and had to be constantly directed, or it was necessary to make suggestions that would remind them of their responsibility. Little or no spontaneous action on their part was observed unless the task promised some personal reward. They were not consistent in their work but had fits and starts of action and it was noticeable that they found it difficult to concentrate well for any length of time without becoming mentally fatigued and showing distraction. Above all, they were extremely sensitive. Some personal discomfort, however trivial, caused great anxiety, while a greater disaster to a fellow club member caused no effect and was promptly forgotten. The patients seemed always to be wishing they could do something that was beyond their mental and physical fitness and were extremely selfcentred. They had few interests outside that which immediately concerned themselves or their family. Regardless of age, they showed an abnormal infantile attachment to parents. They were slow both mentally and physically; stood stress of any sort poorly and rarely if ever appeared genuinely happy. They appeared to be constantly at war with their environment and were forever finding it difficult to adjust and adapt themselves to any change, no matter how simple. What seemed quite pleasing one day might be annoying and irritating the next. Their rapid change of mood went hand in hand with their ability to adjust to the social demands their very existence imposed upon them. They got along poorly with each other and were constantly pointing out defects the others had, but failed to note or recognize that they possessed the same traits themselves. They would have quiet spells where they displayed a strong desire to retreat from the club group and would go to their rooms, busy themselves with looking over their personal belongings and lapse into day dream states. The content of the dreamy states always revealed a personal wish that the

patient seemed unable to gratify or to find anything that would compensate.

All of the characteristic traits mentioned above continued as the patient retreated from his environment. This retreat varied in length according to the individual's ability to stand the mental stress that such a condition involved and then the cycle terminated in a climax of convulsive attacks.

Following the attacks there was a short period of mild lethargy and then the patient began life anew, with a clean slate. The environment, that previous to the attacks seemed so annoying and irritating, now was no longer troublesome. It existed just as it did before the attacks. The patient came in contact with it, but the attack had evidently compensated in some way for the time being and left him apparently contented under conditions that were previously unbearable to him.

In nearly every case the attack acted as a sort of protective mechanism by creating an amnesia for all the annoying and irritating factors present previous to its occurrence. Conditions and events that the patient could not make adjustments to were erased from his memory, sometimes forever, never to be recalled, while in other cases a recalling of painful events immediately brought on another seizure. This protective mechanism enabled the patient to exist with a fair degree of comfort for a time, until the effort to adjust and adapt himself to his environment once more automatically caused the retreat. The symptoms continued until the attack came to his rescue.

Further details concerning the constitutional makeup of the epileptic as I had opportunity to observe it during this study, while I lived constantly in daily contact with the patients, are unnecessary. Dr. L. Pierce Clark has frequently given the facts to the medical profession. They prove the existence of this characteristic makeup so conclusively that there is no room for doubt that it exists and is present long before the first seizure. It is needless for me to say that I found all the patients under my care battling with reality from day to day just as they were able to adjust and adapt; being governed entirely by the degree of constitutional makeup they possessed.

The periodical seizure reactions always relieved the stress of meeting responsibilities the club life presented and shut out the painful conflicts. It then became obvious that the problem was one of reeducation. Once it had been proved that everything possible had been done to correct physical factors, and no relief from the attacks occurred, it was assumed that the patient being unable to meet reality, retreated away from it and that the attack was the climax that brought relief from a state that was unbearable. It was at this point of the study that a plan of reeducation and tactful training was inaugurated with the hope, that by frequent explanatory interviews, at a level of the patient's ability to grasp, he would gradually gain an insight into his defects and learn to adjust and adapt accordingly, thereby preventing the necessity of the retreat which always resulted in attacks. With this view in mind, a careful study was made of each patient's reactions to his environment. His character behavior, charted

daily, showed that when his interests were spontaneous and he was actively engaged with his tasks, he had little difficulty, but as soon as he began to day dream and display states of irritation and annoyance, it was always a sign that sooner or later an attack would follow, unless something could be done to assist him to meet the issues that were evidently the cause of the retreat.

The following plan was then put into operation. Just as soon as the patient began to display day dream states, or became unduly annoyed or irritated, he was taken to a quiet room and told that we would try to find out what the difficulty was and correct it. He was given to understand that this was just a friendly chat and great care was always taken to show a kind and sympathetic attitude in getting him to consent to this plan. He was never given the impression that he was expected to do as was requested but shown that there was some one who was genuinely interested in him and who wished to assist him.

It was soon learned that while each case under observation presented a supersensitive makeup, this sensitiveness had to be measured in order to permit the worker to know just how to approach the patient and get him to reveal willingly the nature of the conflict that was gradually causing him to drift away from reality. An actual indictment is too painful. Most of the patients even resented being told that they were day dreaming, and would frown and set up such a defense that nothing could be gained. Therefore, in beginning the treatment the talks were always referred to a group setting rather than to the individual himself. The very realization of his defects is too painful to the epileptic, so care must be taken to gain the patient's full and willing cooperation during the training treatment. Once the patient relaxes sufficiently to realize his shortcomings, the teaching is then more acceptable to him, but it will be found that the lesson must be gone over many times before he will actually begin to put it into operation of his own accord. The epileptic is quick to note character defects in others but fails to apply this ability where he is personally concerned, hence the necessity of tactfully bringing to his notice, character traits that require correction.

The following episodes are good examples of the types of conflicts displayed by the epileptic and the method used in obtaining the mental content of the dream states is equally applicable to the states of lethargy, annoyance and irritation. It is not asserted that in every case, where the cause of the retreat is learned, and means are produced for its correction, that the attack is prevented, but it was observed that this approach never failed to relieve the acuteness of the conditions noted and put the patient in a mental attitude that enabled him to become productive once more. As the training continued, it was further noted that the patients became changed individuals. Their interests in the club affairs awakened, their memory improved and their attacks began to decrease in force and frequency. They took on new responsibilities just as they showed ability to do so and best of all became aware that it was this insight into their defects that was enabling them to exist in a happier state than ever

before. Patients who displayed a marked and active automatism following their attacks soon showed that this symptom was getting milder and milder until little or no activity was noted after the seizure. Encouraged by the good results, the training treatment was continued and enlarged upon and in every instance the patients showed their pleasure at finding some means that would enable them to meet the conflicting trials that reality presented to their peculiar makeup.

CASE I.—This patient was fifty years old and had had epilepsy for the greater part of his life. His attacks were petit mal in type but varied in degrees of severity according to his conflicts. He had been expecting a visit from his wife for several days. She had written him the exact date and train she would arrive on. He made elaborate preparations for this event and appeared childishly happy. They had lunch together in a little hotel in the village after which they returned to the club. The patient's wife reported that when she met him he was all smiles and apparently happy and in the best of spirits and that this good feeling continued throughout most of the meal but as they prepared to return to the club she noticed that he was beginning to have one of his quiet spells. He appeared depressed and when his wife asked him what was wrong he would not tell, saying everything was all right. He became pouty and disagreed with his wife in everything she suggested. If she wanted to go for a walk, he found fault and wanted to remain at home. This attitude kept up all afternoon until his wife left. For a time the symptoms noted continued but not with the same force. He was taken aside in the evening for a therapeutic talk which occurred as follows: Nurse:—"I'm sure you must have had a very pleasant time today, was everything quite all right?" The patient was silent for a time, assuming a thoughtful attitude and then said: "Well it was and it wasn't—I seemed to be happy to meet my wife and for a time while we were having lunch together everything seemed quite all right, but then I began to feel depressed—things didn't go right." Nurse:—"Was there anything wrong with the dinner or the service, did you feel you wanted anything, wished for anything?" The patient was again silent for a long period, then began to smile boyishly and after several unsuccessful attempts finally resumed:—"Yes—there was something wrong—now that I think of it—but that could not have caused me to feel so mean—could it? You see I have had a cold for several days—I had written my wife about it—and she delayed her visit to me on this account—did not want me to give her the cold I guess—but it was almost gone today, I thought, and I wanted to kiss her—but I said to myself that I could not kiss her because I might give her my cold—I just couldn't help feeling put out to think she was right there and I couldn't kiss her—and it made me mad, I guess—"

Here at last was revealed the underlying cause of the dissatisfied state. A wish for personal gratification that the patient could not gain, plus his inability to even express his thoughts so that there was nothing to do but repress his emotions. If the epileptic could give vent to his feelings in the

form of verbal expression, he would not be compelled to suffer in silence. This training treatment enables the epileptic to acquire gradually the ability to express himself and in consequence there is a marked change in his behavior reactions.

As soon as the conflict was revealed in this case, the patient was given the following advice: "Now John, when this desire to kiss your wife came to you and you realized that having a cold there was a possibility of transferring it to her, you should have spoken up and told her about it and at the same time kissed her hand. In this way you would not have had to repress the desire so sharply, there would have been an understanding between you and there would have been no necessity of finding fault with your wife all on account of not being able to kiss her." This was imparted to the patient in the most kindly tone, not really as a corrective measure, but rather as brotherly or fatherly advice. Then after the talk was over he was asked to give his view of the matter, and it was surprising to note the changed attitude. He was no longer pouty, annoyed or irritated, but gave a free account of his feelings during the day and said that now he realized that if he could have had everything as he wished it, there would not have been any necessity of acting as he did. He retired to his room and wrote a letter to his wife explaining the situation to her and asked her to excuse him for his actions and told her he was going to be more thoughtful in the future.

This patient was extremely sensitive and the approach necessary to get his confidence, had to be done in this kindly manner. First, no mention that he had appeared annoyed or irritated during this visit, had to be kept in mind. The talk was brought about in such a way that it was made easy for him to reveal the conflict. To have asked him why he had appeared annoyed and irritated with his wife would have caused him to set up a defense that would have prevented any cooperation. This is a most important point and one that has to be kept constantly in mind when training such patients. When this patient came under observation he was so sensitive that he took exception to almost every suggestion. He had to receive prompt attention to all his demands or he became violently annoyed. This annoyance lasted for hours and nearly always terminated in an attack but after training treatment had been in force for a year, it was noticeable that he was beginning to put into operation the methods that the teaching offered and in consequence of this insight, the annoyance slowly disappeared and the attacks dropped from six and eight a week to three and four a month. It was further noted that in the beginning of treatment the automatism following seizures was prolonged and of a destructive type, but as he gained in insight and actually kept within his limits, this activity following the attacks soon passed away and the attack itself lasted but half a minute or so. This patient for a long time insisted that his bowels and stomach played a great part in these attacks. He didn't know just how, but said he had always been told that constipation caused attacks. As he gained in insight he slowly gave up the idea, and he said: "It looks as if I would have to change my whole character."

CASE II.—Young man, aged twenty-five years, who had had epilepsy since he was eighteen. He displayed all the characteristic signs of the constitutional makeup. From earliest infancy he was a stubborn, difficult child and had frequent tantrums all through childhood. While he learned easily he never did things that were original or clever and never went into anything deeply. If he had an idea and was balked in it he never argued or teased, but at once threw himself on the floor and went into a tantrum. As he grew older the tantrums were no longer present but were replaced by attacks. For days previous to an attack he slowly began to retreat from activity with the group and could be seen sitting alone apparently in deep thought. He would find fault with the different members of the group. Finally things would get so unbearable he would say: "If I am going to have an attack I wish I would have it and get this feeling over with."

This patient had been taking bromide at the rate of 120 grains a day over a long period when he first came under observation. Even then he was having three attacks of grand mal a month together with three or four of petit mal weekly. The bromide was slowly withdrawn and his attacks increased to two attacks of grand mal a week with one of petit mal daily. The training treatment began just as soon as he was in perfect physical condition. He was gradually shown how his attitude toward his environment was not just normal; that it appeared to be rather childish at times and not at all what one would expect for a young man of his age. Of course the whole approach had to be very tactfully applied so as not to make it too painful for him.

At first he was inclined to think he was doing quite right but soon began to see the logic of it all and then carefully tried to follow out the training treatment. He learned exactly how to control his physical activities, his diet, and to apply the daily teaching in such a way that brought about the best results. His grand mal attacks decreased from the number mentioned to one every six or eight weeks and the attacks of petit mal occurred at intervals of four or five days. His interests increased. He took up a course in agriculture and became more spontaneous in all his activities. At first his only topic of conversation was his parents and other relatives. He carried their letters about in his pocket and used them to produce talk with the club members and strangers whom he met. He was not happy unless he received a letter a day from his parents and wrote one to them but as his interests increased and he became more active in the club life, he soon began to regulate the letter writing to once a week and take up other topics of conversation besides his relatives. This character change all came hand in hand with his insight into his defects and a realization of the conflicts that resulted from them. This patient gave the following view of his difficulty: "If my parents would understand me—they treat me like a child—will never let me do anything so, how can I learn?—I never was let do anything and was always kept down and grew up in a sort of a fear that no matter what I did it was sure to be wrong—and then I got into the habit of always let-

ting others decide for me—it was easier I guess—but I can see now that it was wrong—and I want to learn how to get over this trouble.”

He lost his intensive childish attachment for his parents and became more active in the group settings. Just as he gained insight into his defects and acted accordingly, he became more proficient and had less difficulty with his environment, in consequence of which he had fewer attacks.

CASE III.—Another patient, a youthful epileptic, showed a marked antagonism toward his mother and other members of the family. He insisted that they did not understand him, and by their very attitude, created stressful states that caused him to break. In other words, they held him to too high a standard and expected too much of him. This patient presented a classical constitutional makeup. He was taught in the same careful manner and assisted from day to day to put into operation the lessons given, for he was possessed of a poor machine and simply couldn't do what he realized was right. As he learned and saw the great advantage to be gained by this proper approach, he wrote frequent letters imploring his mother and other members of the family to learn this method of approach and assist him. It is just as essential that the parents have this insight as it is for the patients. With this in mind, the parents and people with whom the patients expected to live after they concluded treatment, were given frequent talks in which they were taught just how the work was carried on. One patient remarked: “If I could get the folks at home to create the same kind of environment as I have here, I know I could go home and do my work there and get well, but things seem different at home; the folks don't understand and I'm always getting into trouble. I can't do things the way they want me to. I have my own way and if I'm let work along the lines that are easiest for me I can accomplish more and am happier.”

From the notes cited in this paper it will be seen that the patients studied showed an inability to adjust and adapt themselves to their environment, which in turn seemed to cause them to retreat from reality. They stood mental and physical stress poorly and lacked the ability to give expression in any way, appearing to suffer in silence until the fit relieved them. The stress of life was too great, yet they were constantly irritated and annoyed because they could not accomplish their desires, regardless of the fact that they were aware of the poor machine that nature had given them. The training treatment that brought such good results in the cases cited was characterized by a gentleness of approach that inspired the patient to reveal the conflict in time so that something could be done to prevent the great damage caused by repression. In this way the patient realized that the difficulty was within and not with reality. He released an affect and had an opportunity to get square with things. He was rendered more receptive, realized that at least some one was interested who understood him, and, in consequence of this good feeling, he was more willing to accept the corrective advice offered. In every case so treated, I have had the

patients tell me that they derived instant relief from the acute annoyance and irritation, and the depression that seemed to cloud their minds passed away and made the outlook brighter, which in turn enabled them to resume their routine work. They became changed persons as they gradually learned to know themselves; they became more proficient and assumed charge of their affairs and directed their actions with good judgment.

The epileptic requires more rest than most people. He can never be hurried. If this training treatment enables such patients to recognize the necessity of this and by carefully following out such teachings. Their attacks are reduced, they become happier and more contented, and it would seem that this form of approach was well worth serious consideration.

I might conclude by saying that at no time is it ever advisable to keep from the patient the true nature of his disease. From the very beginning, just as soon as a positive diagnosis has been made, efforts should be centred on imparting to the patient in the most acceptable form, a thorough knowledge of his disease and the methods by which he is to secure an arrest or cure. By showing him the personal gain to be had from carefully adhering to the rules governing his particular case, he will have this as an incentive, giving hope when reality tends to block his progress.

The cessation of attacks is by no means an indication that the patient is cured. It is also necessary that the patient be able to assume charge of his or her own affairs and, above all, to have a true insight into the nature and conditions that brought about his disease. He must be able of his own accord to direct his actions so as to avoid the stresses that cause him trouble. A changed mental attitude toward himself and his environment must take place before any real successful results can be expected. The training treatment seems the best method of reeducating the epileptic, but it requires great patience and much time to accomplish even a little, but if the fight is carried on tactfully the results are always gratifying and never fail, once the patient begins to act of his own accord.

THE CLUB.

INJECTIONS OF CEREBROSPINAL FLUID IN CEREBROSPINAL FEVER.

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An interesting case of a young boy of fourteen years of age suffering from a severe form of cerebrospinal fever was admitted into the B. D. Petit Parsee General Hospital on April 7, 1920. As the case was unique of its kind in the matter of bringing about the patient's complete recovery from the malady as well as all its concomitant adverse symptoms, nervous, sensory, and muscular, under the injections of the patient's own cerebrospinal fluid, my colleague, Dr. R. Rao, who saw the patient, desired me to report it fully for the information of the profession at large.

The affection started with swellings and pains in the joints, of a shifting character (even the smaller joints of the fingers being involved), accompanied by fever and occasional vomiting. He was treated by a local practitioner for about a month by anti-rheumatic drugs. These had no effect and the condition went from bad to worse. Bronchopneumonia supervened and the patient was delirious at times. In this condition the patient was brought to the hospital and placed under the care of one of my colleagues. The temperature went up from 102° F. to 105°, with an increase in respiration. The pulse was feeble and rapid. He continued to be very excited and was delirious at times. All the larger joints showed a condition of arthritis. There was a bronchopneumonia in the right lung and the general condition was very low.

The following findings were shown from day to day. April 8, 1920, slight leucocytosis, nothing abnormal in the urine. April 10th, the Widal test was negative. On April 11th, a throat swab showed nothing important bacteriologically. On April 13th, the condition seemed serious. The patient improved somewhat under stimulants and oxygen inhalation towards evening but the mental symptoms were more marked. On April 15th, signs of meningeal irritation were noticed. There was a marked retraction of the neck, and rigidity of the limbs. Kernig's sign and ankle clonus were present as well as a bronchopneumonia in both lungs. The general condition was extremely unfavorable. There was a loss of control of the bladder and rectum. A lumbar puncture was made on the 16th, and about one and one half ounces of fluid removed, which was turbid with an abundance of albumin and a negative Fehling reaction. No tubercle bacilli or other microorganisms found. There was a relative increase of polymorphonuclear cells. The culture was sterile. Lumbar puncture was again made on the 18th. The fluid was slightly turbid. There were a few diplococci present resembling pneumococci but they showed no capsule. The culture was negative. On the 19th, a lumbar puncture was again made and fifteen c. c. of fluid removed. On the 20th the patient seemed to be a bit brighter but the general condition was very low, with a rapid, feeble pulse. Smear from a throat swab showed a fair number of squamous epithelial cells, a fair number of pus cells, a few staphylococci, streptococci and diplococci and bacilli. There were no tubercle bacilli. A lumbar puncture was again made on the 21st. The fluid was turbid, the culture was negative. On the 24th the patient seemed to be a little better after the last lumbar puncture. As my colleague had to leave Bombay on the 27th for some time, the patient was transferred to me for further treatment. From the 7th to the 27th the patient had had nineteen injections of camphor in oil, three of pituitrin, four of digitalin, and five of strychnine (before meningeal symptoms were discovered) and four lumbar punctures together with stimulants by mouth such as musk, ammonia, digitalis, brandy, and oxygen inhalations. On the 27th I noted the condition of the patient to be as follows:

The patient was unconscious, lying with his head rigidly retracted with staring eyes and dilated pupils, which did not react to light or accommodation.

There was no nystagmus or strabismus, a marked rigidity of the muscles of the neck, abdomen, and back was manifest and all the limbs were strongly flexed. There was absolutely no control of bladder or rectum. Kernig's, Babinski's, and ankle clonus were present. There were tremors of the limbs and body (more of the upper half) with bronchopneumonia of both lungs and a rapid feeble pulse. The patient would shriek at times and utter low moans frequently.

The patient was put on a simple diaphoretic mixture with aromatic spirits of ammonia as the only stimulant. Urotropin and guaiacol carbonate, five grains of each, were given twice a day and an injection of mixed influenza vaccine consisting of pneumonia, streptococci, influenza bacilli and staphylococci was given every day.

On May 8th the signs of bronchopneumonia were not so extensive, and though the temperature was slightly affected under vaccine therapy, the meningeal symptoms remained the same. On the 9th all medication was stopped. On the 11th the patient was restless all the night, shrieking loudly all the time. Hyoscine injections and bromides were given but had no effect. At 3 a. m. cold sponging was resorted to as the entire body of the patient was trembling. On the 12th a lumbar puncture was made and ten c. c. of fluid was withdrawn. It was sterile. Chemicals reactions could not be taken as the amount of fluid was too small. Of this fluid three quarters c. c. was injected subcutaneously and it was repeated every day till the 17th. Gradually the temperature fell and meningeal symptoms abated with every injection until the 18th, when the temperature dropped to 97° F. The patient appeared brighter with a marked improvement in his general condition. The pupils were still dilated but reacted to light. On the 22nd the condition was better. He kept his eyes closed. The pupils were not so widely dilated. Stiffness of the neck was less marked. On the 24th the patient put out his tongue on being asked to do so for the first time. Intelligence was improving every day and at times he answered questions in monosyllables. On the 26th the patient spoke a short sentence for the first time. Memory seemed to have failed. He knew nothing about his illness. The stiffness of the neck was not so marked. He lay with his upper extremities and left leg extended. On June 6th the tremor was still present, though not continuous. On the 8th the tremors disappeared. There was very little rigidity of the limbs. The pupils were gradually contracting but the patient could not read clearly and lucidly. It took time for the patient to recognize letters and he made mistakes in deciphering what he had learned before. His memory had failed to a great extent though he could give his own name and the names of his father and one sister, he had forgotten the names of his six brothers, one sister, and his mother. He was given daily lessons and was made to read papers and school books. On the 10th he was able to speak and read without difficulty and understand what he read. The rigidity of all the muscles excepting those of the right leg disappeared. He still passed urine in bed. On the 16th he was better in all respects, and asked for the urine bottle when he wished to pass urine. On the 20th he spoke

intelligently and was able to read without difficulty and sat up in bed without any help. On the 26th of July he left the hospital in perfect health without the slightest defect.

CONCLUSIONS.

1. The case was very serious and of a severe form of cerebrospinal meningitis from the very beginning.
2. The disease simulated rheumatism in the beginning. Neither the salicylates nor other medication had any effect on the course of the disease. If anything, the condition went from bad to worse.
3. There was a distinctly good effect from the mixed influenza vaccine in the bronchopneumonic condition, but not on meningeal symptoms.
4. After the administration of the vaccine and urotropin the cerebrospinal fluid was found sterile and clear.
5. It is certain that both the vaccine and urotropin had no effect on his meningeal symptoms and fever.
6. The fever and meningeal symptoms abated gradually every day under injection of the cerebrospinal fluid.
7. His complete recovery was due to the injections of his own toxins contained in the cerebrospinal fluid without which the patient could not have made an advance toward such an uninterrupted and perfect recovery.

CUMBALLA HALL.

VENESECTION: A LOST ART.*

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HISTORY OF VENESECTION.

Venesection or blood letting is a measure that has been employed almost universally and has been traced back to about 2500 B. C. (1), its unwritten history probably being of far greater antiquity. Hippocrates (460-370 B. C.) bled extensively and wrote a treatise upon the subject. Galen also let blood in many cases; he is quoted as the first to specify the proper quantities to be withdrawn under various conditions, recommending from a half pint to a pint and a half in the average case.

Through centuries of ancient and medieval history frequent references are made to venesection, and there is no doubt that the practice was often abused. In the fifteenth and sixteenth centuries (2), Pierre Brissot stands out as a reformer. There was much controversy over the site of bleeding, the Arabic teaching being that blood should be drawn at a distance from the lesion, whereas the more strict followers of Hippocrates preferred to open a vein near the lesion and on the same side of the body.

Sydenham (1624-1689) revised the application of blood letting, and used it extensively but with discretion; usually he began treatment by opening a vein, but seldom took more than eight or ten ounces at a time. Hahnemann and the homeopathic school (1779-1843) founded their indictment of orthodox medical practice largely upon the indiscriminate bleeding in favor with the German physicians of their day. In the early part of the nineteenth cen-

ture, venesection was still in vogue, with a tendency toward its abuse. Louis, in 1835, advised against its promiscuous employment and especially insisted that it was of little worth in pneumonia. In the latter part of the nineteenth century, blood letting had become restricted to conditions clearly indicating its employment. Of late it seems to be used only on rare occasions. If we were to question interns in nearly all hospitals as to the number of venesections performed during a six months' period of their service in medical wards, their replies would indicate that it is almost a forgotten measure. Yet, when we come to consider the number of conditions in which it gives relief without danger, especially in certain phases of common diseases, we find that definite indications for its application are by no means so rare.

INDICATIONS FOR BLOOD LETTING.

Blood may be taken by opening a vein, by inserting a cannula into a vein, or by means of wet cups or leeches. Each method has conditions of election, but, generally speaking, venesection is the most prompt and certain. It is a relatively simple measure, and is easily carried out, both at home and in the hospital. No doubt it may be a somewhat gruesome affair when performed at the house with little or no assistance, but it is feasible even then. Its indications are, in general, of two classes—a, palliative, where its employment materially adds to the patient's comfort for the time being; and b, restorative, when it may, in addition, prolong life or even determine recovery.

Textbooks (3) furnish us with lists of conditions in which venesection may be of use. I need not emphasize apoplexy, Osler's or Vaquez's disease, pulmonary edema, eclampsia, or other conditions in which blood letting is more or less recognized as part of the routine treatment. Nor shall I dwell on all the others; but for present purposes shall limit myself to some five, in which it may be safely done with marked benefit but is too often omitted. These are—pneumonia, influenza, and other acute intoxications, cardiac affections, uremia, and vascular hypertension.

It is understood, of course, that I refer only to certain phases of certain cases. Venesection is not to be ordered promiscuously in any class or set of cases. Only when clearly indicated will it reward us with definite and helpful results.

BENEFITS TO BE DERIVED FROM VENESECTION.

The amount of blood in an animal is said by most authorities to be about one thirteenth of the body weight. Haldane and Smith (4) give one twentieth of the body weight as the figure in man.

In venesection, as in hemorrhage, there is loss in vascular content both in fluid and in cells (5). The diminution in volume manifests itself at once; that in the corpuscular elements may not reach its greatest point for several days, evidently depending upon the manner in which blood replacement takes place. The volume is probably restored in a few hours by rapid absorption of fluid from the tissues; thus the blood becomes greatly diluted, as manifested by the reduction in hemoglobin. This is a natural sequence of events. Lee (6) makes use of the hemoglobin estimation as a guide to blood volume, and this has

*Cases studied in Dr. S. Solis-Cohen's service at the Jewish Hospital.

its prognostic value. A patient presenting a relatively low hemoglobin—say sixty to eighty per cent.—at the end of twenty-four hours or more after hemorrhage is in much better condition than one who presents a hemoglobin ratio of a hundred per cent. In the former case the vessels have been refilled. In the latter case there has been no influx of fluid.

Bearing these facts in mind, we may discuss the benefits of venesection. These may be enumerated as follows:

1. *Relief of an overdistended right auricle*, a fact noted in animal experimentation, and which plays an important rôle in therapeutics.

2. *Diminution in blood volume*; this is only temporary.

3. *Diminution in blood viscosity*, as a result of replacing the diminished volume by the fluids of the tissues.

4. *Reduction, or sometimes elevation, of blood pressure*. This demands fuller discussion elsewhere.

5. *Diminution of toxemias*. This is to be observed not only in uremia but markedly in certain acute infections, particularly that baffling group which we have been in the habit of calling gripe or influenza. I shall speak first of these toxic infections in the discussion of conditions in which venesection is useful.

INDICATIONS FOR BLOOD LETTING.

Infectious toxemia.—This type of infection comes on with an apparent suddenness, perhaps after a precedent coryza or sore throat, and manifests itself as an overwhelming intoxication, with prostration, intense headache, and cyanosis. It seems to have a predilection for attacking the heart muscle almost from its very onset, as evidenced by the feeble heart sounds and the weak, rapid pulse, commonly of a low pressure. S. Solis-Cohen, in his clinical conferences with classes at Jefferson Medical College, has pointed out that cases in which hemoptysis or profuse epistaxis occurs early, have, as a rule, a favorable prognosis; terming this "Nature's hint to the physician."

Venesection is accordingly indicated when the pulse rate increases, the systolic pressure diminishes, cyanosis becomes more intense, and evidences of pulmonary congestion appear, together with an increase in cardiac dullness to the right—in short, when, with progress of the toxemia, the heart is about to give way. Blood letting, with the removal of eight to ten ounces, exerts an obvious beneficial influence upon the course of the infection, and this may prove to be the turning point toward recovery. If for any reason venesection is impracticable, wet cups or leeches may be applied instead.

The benefits observed may be attributed, in part, no doubt, to the relief of the overburdened right heart; but I do not believe that this factor alone is to be credited with the resulting rise of blood pressure, disappearance of cyanosis and improvement in heart sounds. The removal of so much blood, overladen with toxic products or bacteria, possibly both, plus the resulting factor, viz: the draining off of tissue fluids, evidently has something

to do in bringing about the happy change of condition.

Is it not possible that when the fluid is drained off from the tissues, more or less of the toxins which have been harassing the tissue cells are removed and normal function is encouraged to reestablish itself? In the few cases that I have observed, this influence seems to be quite evident and asserts itself quickly, say within twenty-four hours. Patients who had the appearance of being washed out, who were rapidly going down hill, and in whom the prognosis seemed grave, appeared to pass through a peculiar period, analogous to the crisis, after which period they not only looked stronger and more comfortable, but voluntarily told us that they felt so.

This may be illustrated in the following case, which ordinarily would be diagnosed influenza, but which I think belongs to the group of streptococcus infections. It may be noted, in passing, that the danger in influenza is virtually always from some concurrent infection; in the recent epidemics, apparently streptococic.

STREPTOCOCCIC TOXEMIA.

CASE I.—Mrs. B. G., aged sixty years Admitted June 13, 1920, with the history of a so-called cold in the head, soreness of throat, intense headache, palpitation. Had been suffering with heart trouble during the past twenty years. Examination revealed an angry looking and injected throat; cyanosis of lips and finger tips. Heart showed auricular fibrillation and partial heart block; congestion of lungs. White blood cells, 8500; blood pressure, systolic 90, diastolic 50. The patient's condition became progressively worse despite the usual medicinal treatment.

June 16th, 6 p. m. Patient was very restless, stuporous, did not recognize her children. Temperature 102.3° F.; pulse 120; respiration 30. White blood cells, 10,000; blood pressure, systolic 108, diastolic 58. 8 p. m., venesection; ten ounces of blood taken. 10 p. m., the patient seemed brighter, with the stupor subsiding. June 17th, the appearance was brighter, respirations less labored, blood pressure 105-62. June 19th, temperature normal, pulse 70, respiration 28, blood pressure 110-65. In this case venesection was performed despite a relatively low blood pressure. The patient made an uneventful recovery, except for a pleuritic pain, which disappeared within two days.

PNEUMONIA.

I shall not discuss the advisability of bleeding early in pneumonia. Personally, I have not resorted to it. Years ago it was a routine measure, but despite the fact that some still teach it to be indicated when dealing with full blooded, plethoric individuals with high tension, I doubt whether it is now applied in even a small proportion of cases.

It is my intention, on the other hand, to emphasize as strongly as possible the good results of venesection in certain stages presented during the course of a pneumonia, especially when there are signs of impending danger from a dilating right heart. This, as is commonly recognized, may be manifested by feeble pulse, with increase in rate, more or less

marked cyanosis, signs of increasing pulmonary congestion, and extension of cardiac dullness to the right. A gradual or, less commonly, a sudden drop of the diastolic pressure may be added to the list of ominous happenings. When this clinical picture is present, we must realize that we are dealing with a profound toxemia and an overworked, tired and softened myocardium, which is trying to continue functioning but is slipping and failing. We may likewise realize that pneumonia kills not through consolidation of the lungs, but by depressing the heart and vessels both directly and through the autonomic nervous system.

Prevalent treatment in the form of medication is directed chiefly to stimulating and encouraging the heart to keep up its good work, with the hope that the infection will run its limited course before the heart collapses and the patient dies. With this in mind, why not materially aid the heart instead of merely encouraging it? Words of cheer in the form of stimulation will give us results—that is true enough—but venesection will enable the heart to respond more promptly and probably save a certain percentage of patients who would otherwise perish. Pneumonia, truly, is a battle for life from its very beginning, and every patient has a chance so long as the heart beats and so long as the lungs functionate. Therefore, we should stand by and fight for and with the patient regardless of how dark the outlook. It may require a little courage to decide upon venesection when conditions are so poor, but we may give the sick man the benefit of the doubt. Nor have I permitted a low blood pressure to deter me from this course of treatment. Nothing is more startling to the inexperienced than the manner in which the pulse steadies and the pressure rises after bleeding, in cases of the kind described. In the instance which I am about to cite, the systolic pressure never reached higher than 120, and the diastolic pressure dropped steadily from fifty to ten. At this point venesection was performed, removing ten to twelve ounces of blood. In my judgment, this enabled the man to make his successful fight for life.

MASSIVE BRONCHOPNEUMONIA.

CASE II.—H. D.; twenty-two years; mechanic. Admitted May 21, 1920, with a history of shortness of breath and pain in the left side following a chill, the preceding day, May 20th. There had been before this a cold in the head and chest lasting three or four days. Examination revealed an extensive bronchopneumonia approaching the lobar type on account of the large area involved. Temperature, 102; pulse, 120; respiration, 34. Lips and finger tips were cyanosed and there was some tenderness over the liver—a symptom that I have noticed in others suffering from this type of infection. Leucocyte count, 7,000; blood pressure on admission, systolic 105, diastolic 30.

May 27th, patient's condition very low. Temperature, 102.4° F; pulse, 116; respiration, 50.

The man complained of tearing like pains in the right side of chest, when coughing. He presented a picture of prostration and exhaustion. The systolic pressure remained at 120, due to stimulation, as the patient was being treated according to the definite plan (7). The diastolic pressure, however, dropped

to ten; *this was the time selected for venesection.* Ten to twelve ounces of blood were removed from a superficial vein. The patient's condition remained, at first, unchanged except for *an improvement in diastolic pressure, which rose to forty.* The following day, May 28th, the patient was more comfortable; blood pressure, 120-20; pulse subsiding, drop in temperature. May 29th, a definite change in patient's condition. Although examination revealed persistent consolidation in the right base, there was marked general improvement; the temperature was normal; the pulse ranged between eighty and ninety, and blood pressure was more stable, systolic, 118; diastolic, 45. June 11th, patient showed delayed resolution. Gradual recovery ensued, and the man was discharged well, June 20th, a month after admission.

Permit me now to cite another case of pneumonia where venesection was successful in giving needed relief. The patient was seen in consultation with Dr. Joseph Aspel, to whom I am indebted for the report.

CASE III.—Lobar pneumonia, with dilating right heart and tendency to pulmonary edema. B. R., aged forty-seven years; illness began June 8th, with chill and fever. Examination revealed poor heart sounds, some râles at bases especially on left; mild delirium. Temperature 102.2° F., pulse 124, respiration 40; blood pressure, systolic 98, diastolic 58; respirations moist and labored; treated by definite plan. June 11th. The condition was worse; patient delirious; distinct cyanosis about lips and finger tips; heart sounds more feeble. June 14th. Condition grave; patient very toxic; abdomen distended; cyanosis; moist breathing; pulmonary congestion marked; pulse more rapid; 9 p. m., temperature 103, pulse 140, respiration 40; 10 p. m., venesection was performed; sixteen ounces of blood removed from superficial vein; midnight, temperature 102, pulse 118, respiration 36; pulse good. June 15th. Rested more comfortably, seemed brighter; respirations not so moist. From this day patient made a gradual but uneventful recovery.

CARDIAC CONDITIONS.

Cardiac dyspnea.—When dyspnea in cardiac affections becomes so acute as to make the patient decidedly uncomfortable, even while resting in bed, the advisability of venesection should be seriously considered.

CASE IV.—The clinical picture indicating its employment may be illustrated by this case which presented a mitral regurgitant lesion and an enlarged heart, with all the evidences of decompensation. While making rounds, my attention was called to this man, who, with a blue face, was having extreme difficulty in breathing, moaning and groaning with his respirations. The eyes were staring; the dyspnea was so intense that speech was impossible; the hands were cold and the pulse almost gone. This patient seemed moribund and I had little hope that anything could be done. He responded somewhat to camphorated oil, but did not improve sufficiently to change the prognosis. Venesection was done as a last resort. The loss of sixteen ounces of blood produced an immediate change for the better. The cyanosis lessened, the dyspnea soon became less

urgent and the man was able to speak. His heart now responded more readily to medicinal stimulation and in a few days showed decided improvement.

Another cardiac case in which dyspnea was the main symptom but did not have in the background the picture of an impending acute dilatation, may be cited.

AORTIC REGURGITATION WITH FAILING COMPENSATION.

CASE V.—M. C., aged forty-eight years; in Dr. S. Solis-Cohen's service at the Jefferson Medical College Hospital. This man suffered from aortic regurgitation of long standing. I was going through the wards with Dr. Solis-Cohen, when he found the patient markedly distressed with dyspnea and profound cyanosis. He at once ordered bleeding. The withdrawal of sixteen ounces of blood from a superficial vein brought about relief, which lasted not for a few days only but for the rest of the patient's stay in the hospital; and, when discharged, he was, and had been for two or three weeks, able to move freely about the ward. This result was impressive and is indeed largely responsible for this paper.

Acute dilatation.—Venesection is so clearly indicated that it scarcely needs comment. I would only say that it is often delayed too long.

UREMIA.

Uremia is an interesting field for venesection since it is an intoxication, whatever the toxic substances may be. There is usually an associated vascular hypertension, particularly when we are dealing with uremic dyspnea; and occasionally we are called upon to treat cerebral accidents simulating embolism and apoplexy, presenting a clinical picture of unconsciousness and paralysis or spasm; and, at times, convulsions; pulmonary edema may likewise occur in uremics.

In uremic dyspnea (8), when associated with high blood pressure, an effort should be made to relieve the left heart, either by vasodilators or bleeding. Bleeding gives better results than the vasodilators. The benefits derived from venesection are attributable to:

1. Relieving the burden of an overworked heart, by diminution both in the volume and the viscosity of blood.

2. Removal of toxins and toxic products.

3. The resultant drainage of the fluid from the tissues, thereby giving more or less aid to the tissue cells in their attempt to get rid of waste products.

UREMIC INTOXICATION WITH DYSPNEA.

CASE VI.—I. W., aged sixty years; admitted June 12, 1920, complaining of dyspnea and drowsiness. The eyes were baggy, temporals tortuous; peculiar foul odor in breath; tongue coated; skin dry; abdomen and extremities, no bearing on case; blood pressure; systolic 160, diastolic 68; oliguria; blood urea 90.

The patient did not respond to medication, nor to the usual procedures to stimulate elimination through the skin, e. g., hot packs, electric (hot air) cabinet, and pilocarpine. June 16th. Drowsiness more intense, approaching stupor; very restless; stertorous breathing. Venesection performed; sixteen ounces removed, with resulting improvement

of patient's condition, especially lessening of restlessness. However, all attempts to get the skin active were futile and the patient died June 30th.

This case is cited merely to show that bleeding may be indicated palliatively even if it does not give us a curative result. It cannot, of course, make a new heart or new kidneys.

I shall not take time to discuss in detail, but may mention that blood letting is indicated in uremic coma, in pulmonary edema occurring in uremics, in hypertension and early stages of uremic spasm and paralysis, particularly when they do not respond to the ordinary measures. Incidentally, I may call attention to muscular twitchings as an early and neglected symptom of uremic intoxication.

VASCULAR HYPERTENSION.

This measure need not be considered routinely when dealing with cases of hypertension, a condition about which so little is known from the etiological viewpoint. However, after we have treated our patients with the usual array of medication, electrotherapy, and cabinet baths, with little or no success, and they are beginning to show signs of discomfort from the general disturbance of circulation, then I do think venesection is indicated, being in reality a measure of last resort, which should result in more or less relief, particularly in cases in which pulmonary edema has developed. The following case may be cited:

HYPERTENSION AND CHRONIC DIFFUSE NEPHRITIS.

CASE VII.—H. S., aged thirty-five years; admitted June 11, 1920, with dyspnea. The patient had recently been discharged from the wards as improved. The hypertension had previously been treated with everything at our command, both medication and eliminative measures. The man responded at first, but later the blood pressure again reached its height. On readmission the blood pressure was 205-130; the urine showed a light cloud of albumin with a few hyalogramular casts. Blood urea was 39. During the night of June 12th, there developed an acute dyspnea followed by pulmonary edema; frothy, bloody fluid exuding from nose and mouth. Fortunately, a resident physician was at hand. Venesection was done promptly, sixteen to eighteen ounces of blood being taken. A hypodermic injection of morphine and atropine was given. The patient went to sleep and, in the morning, was none the worse for his experience. In this instance, the venesection was instrumental in tiding the patient over a critical period; but would it not have been more advisable to bleed earlier and thus avoid such accidents as the pulmonary edema, which if not managed promptly and judiciously, may end disastrously?

SUMMARY AND CONCLUSIONS.

To recapitulate. It is not my intention to urge blood letting in a haphazard manner. We should always have in mind some definite benefit reasonably to be expected from its immediate effect. In the course of the paper, I have endeavored to point out these effects and conditions wherein they are indicated. Bearing such qualifications in mind, venesection or other forms of blood letting may be useful in the conditions to be enumerated.

1. In the toxemias associated with influenza and in the grave stages of pneumonia, when the intoxication is overcoming the efforts of the heart and the circulatory system to maintain life; the clinical picture being that of a dilating right heart with rapid and feeble pulse of low tension, cyanosis, dyspnea and more or less stupor. Venesection, under these conditions, may be the deciding factor of recovery.

2. In cardiac affections. Blood letting for acute cardiac accident—acute dilatation—needs no comment. Here we may observe that when a patient, with chronic valvular or myocardial lesion, is decidedly uncomfortable, when the dyspnea is so persistently constant and severe as to make his existence one of torture, this manifestation usually having a clinical picture of failing compensation in the background, well timed blood letting will not only prolong life, but will give the patient a degree of comfort surpassing that obtainable through morphine.

3. In vascular hypertension. Blood letting will not remove the cause of trouble; but after all other methods, medicinal, electrotherapeutic and hydrotherapeutic, have failed to give relief, venesection does palliate, at least temporarily; and it may be instrumental in warding off complications, such as acute pulmonary edema and apoplexy. The question of the possible benefit of earlier and repeated minor blood lettings is raised but will not be discussed here.

4. In uremia. Venesection—sometimes leeching—is of benefit in the uremic cerebral accidents, such as coma, convulsions and paralysis or spastic contraction. It should be done earlier in uremic dyspnea, which is usually associated with hypertension; and the measure is especially indicated, as shown in Case VI, when we are dealing with an intense uremic poisoning, with no diaphoretic reaction to heat or pilocarpine. Blood letting is then the only means whereby toxic substances can be eliminated.

5. Other conditions. It is obvious that states, such as apoplexy, eclampsia, polycythemic cyanosis, certain phases of aneurysm, carbon monoxide poisoning and pulmonary edema, regardless of the underlying cause, afford suitable indications for blood letting.

TECHNIC.

Beyond asepsis, the technic of venesection is not highly important. Whether a large calibre needle is inserted into a superficial vein, or whether the vein is opened, with or without cutting down upon it, matters little. Personally, when there is time, I prefer to use a local anesthetic, and to cut down upon, dissect and open a vein of the elbow. It is a clean and not difficult way of going about it. The other details do not call for discussion. The amount to be withdrawn should be not less than eight to ten ounces and not more than sixteen to twenty-four ounces at a time, depending upon the pathological indications and the condition of the patient.

In concluding, I may say that this paper is simply a plea for a more frequent use of venesection when indicated. I do not profess to bring out anything original, but merely to emphasize the fact that blood letting is a useful measure, especially in conditions of poisoning and of embarrassment of the

circulation that other means have failed to, or obviously cannot, relieve; and that when applied judiciously it should give us the pleasing results that we strive for in medical practice.

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THE RELATIONSHIP BETWEEN DISEASED TONSILS AND PULMONARY TUBERCULOSIS.

BY WILLIAM L. RHODES, M. D.,
Wichita Falls, Tex.

That diseased tonsils have a direct relationship to pulmonary tuberculosis in its initial stage is becoming more and more evident as time goes on and opportunities for the study of the great white plague present themselves. In a series of cases of pulmonary tuberculosis referred for nose and throat examination during the past six years, it has been my observation that practically every case gives a history of recurrent inflammation of the tonsils at some time or other, and upon examination, the crypts are found to be filled with a deposit of thickened pus. This history of a recurrent inflammation of the tonsils, in connection with a tuberculous infection of the lungs, does not always hold good. Some cases give no history of a tonsillar inflammation but upon examination of the tonsils we find the crypts filled with deposits of thickened pus.

While in the Army, I had the opportunity of doing practically all the eye, ear, nose, and throat work for the thirty-fifth division, approximately 28,000 men, and the opportunities for the study of the relationship between diseased tonsils and pulmonary tuberculosis, in its incipient stage, were manifold. In looking over the records of the various cases, I cannot find a single case of tuberculous infection which did not give a history of tonsillar involvement associated with it.

It is common knowledge that diseased tonsils may cause rheumatic conditions, and that upon removal of the tonsils, the rheumatic condition subsides a short time after operation. It is also common knowledge that the worst types of carrier case during a diphtheria epidemic are the types having hypertrophied and diseased tonsils preceding the diphtheritic attack. This was brought to our attention in a striking manner during an epidemic of diphtheria among the men of the thirty-fifth division in Alsace during the months of July and

August, 1918. The entire personnel of one field hospital during the epidemic devoted their whole time to the treatment and care of the infected men. A field laboratory, in charge of two able and experienced laboratory men, was added to the personnel of the company, and did good work in helping to eradicate the epidemic.

The division surgeon instituted a novel feature in the form of a gas chamber, in an attempt to eliminate the disease from the carrier cases. The men were subjected to the treatment of chlorine gas for several minutes each day for several days, but with no appreciable result. Following the gas treatment, cultures were made by the laboratory men, who reported the organisms as virulent as ever. These patients were then referred for tonsillectomy, after which they were again placed under the observation of the field laboratory men, and in the course of another week were sent back to duty as noncarriers.

It may be of interest to note, as a refutation of the theory that chlorine gas is of benefit in the treatment of carrier cases, that eventually a number of cultures, in open tubes, were placed in the gas chamber and exposed to the action of the gas for several hours each day, for a period of three or four days. The laboratory men reported absolutely no detrimental effect upon the organism.

Getting back to the subject of the relationship between diseased tonsils and pulmonary tuberculosis, I will state that men sent into the hospital with symptoms of an incipient pulmonary phthisis were referred for a nose and throat examination. These examinations consistently revealed diseased tonsils. In a number of cases, in fact as a routine measure, tonsillectomy was advised and performed as an adjunct to the treatment of the pulmonary condition. In the larger proportion of cases thus treated, beneficial results were obtained in the general physical wellbeing of the patient. Men were frequently returned to active duty, who otherwise would have been sent to the rear, and eventually lost to the service.

The opportunities for further study of these cases were limited, due to the rapid movement from sector to sector, together with the losses sustained in action, both from wounds and from sickness, so that it is impossible to state whether or not beneficial results of a permanent nature were obtained. However, since returning to private practice it is possible to study further the cases of incipient pulmonary tuberculosis in which tonsillectomies have been performed, with the result that up to date, in the majority of such cases, a decided improvement has been observed.

It is somewhat premature to assert that an actual cure took place in these cases, but it is safe to say that there is a notable improvement in the general physical wellbeing of the patients thus treated, where the pulmonary infection was not too far advanced at the time of operation.

It is not my intention to create the impression that I advocate the removal of the tonsils as a cure for pulmonary tuberculosis. It is advanced as a theory only, unsustained as yet by laboratory and clinical findings. I do maintain, however, that

there is a distinct relationship between diseased tonsils and pulmonary tuberculosis, and that marked beneficial results upon the general wellbeing of the patient are obtained by tonsillectomy when performed during the initial stage of the disease. It is my personal opinion that in at least fifty per cent. of all cases of pulmonary tuberculosis the infection is derived primarily from a focus of infection in the crypts of the tonsils, and that a tonsillectomy is a highly important and necessary procedure as an adjunct to the general treatment of this condition.

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Postoperative Analgesia.—B. van Hoosen (*American Journal of Obstetrics*, December, 1919) states that the technic of postoperative analgesia should be directed toward the prevention rather than the relief of pain. It should include the avoidance of psychic trauma before and tissue trauma during the operation. Gas pains, thirst, emesis, and catheterization must become avoidable and infrequent occurrences. The procedure recommended comprises scopolamine morphine anesthesia—begun very early on the morning of the operation—no catharsis before or during the week following operation, and all preparation of the operative field, including catheterization, in the operating suite one half hour after the second hypodermic injection of scopolamine and morphine. The latter combination yields a period of analgesia of from eight to twelve hours after return of consciousness. If it is desirable to continue the analgesia for a longer time, one two hundredth grain of scopolamine and one thirty second grain of morphine, or one four hundredth grain of scopolamine and one sixty fourth grain of morphine, may be prescribed every four hours, beginning about four hours after the operation and continuing for twenty-four to forty-eight hours, according to the probable length of the period of postoperative pain. Relief of gas pains and of thirst, and avoidance of catheterization, are all obtained by a simple procedure:

While the patient is on the operating table and the abdomen is being closed, an enema of two quarts of water containing three hundred and sixty grains of sodium bicarbonate is rapidly administered—average time, two minutes—through a colon tube inserted into the rectum not farther than three inches. This enema is retained by all patients except in hemorrhoidectomies and in some thyroidectomies. After the patient has been taken to her room and is comfortable in bed—about twenty minutes after the first enema—another enema of two or three quarts with or without the bicarbonate, is given, but more slowly, viz., in ten to fifteen minutes. This enema is likewise retained. Pain in the wound should not be appreciable and is obviated by the use of sharp instruments during the operation, blunt dissection being avoided, and by gentle and infrequent sponging. The position in which the patient is placed after operation also plays a part in the relief of pain; it should be comfortable and such as to afford relaxation or support to the parts, according to the requirements in the individual case.

Editorial Notes and Comments

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HYPNOTISM AND PSYCHOTHERAPY IN THE SIXTEENTH CENTURY

Dr. Camille Rouzeaud, in an interesting student's dissertation (*L'Hypnotisme et la Psychotherapie au XVI Siecle*, Camille Rouzeaud, Jouve & Co., Paris, 1918), throws new light on this subject as considered from a historical viewpoint. While the recognition of hypnosis as a true state dates well back into history, it has been commonly assumed that it did not excite serious scientific attention until the nineteenth century, when Charcot in his article on Faith Healing set the medical world by the ears in discussion for and against his theories. The accepted belief has been that although the influence of mind over matter was acknowledged at a much earlier date than this, the source of the power was accounted altogether supernatural: if beneficent, to be assumed as a miracle and if otherwise, to be laid at the door of sorcery. The principal interest in what Rouzeaud has written lies in the fact that he quotes as authorities for the affirmative side of his discussion the names of authors little known to the majority of the medical world. Paracelsus and Kircher are names which are familiar in connection with the subject, but those of Cornelius Agrippa, Pietro Pomponazzi, Cardan and Van Helmont do not appear in the lists of those who dealt with this subject. Braid, Esdaile and Elliotson, who saw service with the British Army in the East, learned of hypnotism from the Hindus and their contributions to the literature of the subject made hypnotism a going con-

cern in the nineteenth century but back of them there is little evidence to prove that in earlier times either hypnotism or psychotherapy was considered as a natural process rather than a supernatural manifestation.

While Rouzeaud readily admits that the deductions of Agrippa, Pomponazzi and the other observers quoted were in part crude and faulty, he makes the claim that they did recognize the fact that there was a distinct and natural relation between the mind and certain pathological states of the body and furthermore, that these mental processes could be utilized as therapeutic agents. Faulty reasoning was to be expected in times when scientific methods were vague and when, in addition, investigations along this line were difficult because they carried the stigma of witchcraft to those who pursued them. Rouzeaud quotes extensively from Agrippa and also from Pomponazzi in proof of the fact that these men recognized as fundamental truths what we know to exist from the more enlightened research of later years, and while transcription of all that he has cited would occupy undue space, it is allowable to extract from it in order to show that there was in the sixteenth century a recognition of the logic of cause and effect in the relation of certain states of the mind and the body.

Pietro Pomponazzi, professor at the University of Padua, wrote a treatise on enchantments which was published after his death in 1525 and was his answer to a question as to the possible explanation of miraculous cures. In this he says:

"The people are in the habit of attributing to Divine or demoniac origin those things which they are unable to understand. Every science grows by the aid of research and by recorded experience. Spirits can influence matter only by the exercise of material laws. It is possible for men to discover these natural laws and make use of them to obtain the same natural effects. Many learned men who have been regarded as magicians or necromancers have never had any intercourse with the spirit world, and it is further probable that they hold with Aristotle that spirits (*démons*) do not exist. It is entirely right and proper to look for the natural cause of these so-called supernatural cures and this cause is the imagination which gives rise to four important states—desire, pleasure, fear and pain." Pomponazzi goes on with the theory that the imagination can produce material changes in the material body and, perhaps heretically, suggests that it was through this means, rather than by any miraculous

agency that St. Francis acquired the marks of crucifixion borne by Christ. (Charcot, *The New Review*, December, 1893). He says, "We have already seen what influence faith and the imagination play in these cures and in their failures. The cures obtained by touching sacred relics are produced only by means of the imagination of one of great faith."

He cites the effect of prenatal influence on the child and asks if this be so why the production of the same effect should not take place in the body of one who refers the same mental effort to his own person. All in all, a very frank exposé of what is a recognized part of the psychotherapy of today—autosuggestion.

Cornelius Agrippa was the physician of Maria Theresa, mother of Francis I of France, and Rouzeaud in comparing his opinions with those of Pomponazzi says: "In *La Philosophie occulte* Cornelius Agrippa describes and explains the same extraordinary phenomena due to the action of the mind on organic life. His explanation in this work reminds us much of that of Pomponazzi: but it is much more complete and precise and furthermore he marshals a great number of facts as evidence. There were already enough, but he cites many more, and in this, according to our view, his originality lies. He essays to connect pathological and normal phenomena, convinced that the same laws govern each, something which modern science has conclusively demonstrated. He points out the effect on the body of joy, fear, grief and the other emotions; the anesthetic effect of extreme ecstasy and in regard to autosuggestion carries on the line of reasoning followed by Pomponazzi. As a means of inducing the hypnotic state he cites: 1, Narcotics and anesthetics; 2, amulets, talismans and similar objects; 3, strong imagination and 'animal magnetism'; 4, action on the sense of sight; 5, action on the sense of hearing; 6, effect on the emotions (fear, etc.)," and as Rouzeaud says, "This list is very complete and we of later years have added little if anything to it."

The later investigations of Bernard, Dusart, Janet and others confirmed the theories of these pioneers of the sixteenth century in the field of psychotherapy.

In addition to the quotations from medical men of the times, Rouzeaud cites as significant of the truth that other than a supernatural origin was ascribed to the relation between the mind and the body at this early date, the fact that in the writings of laymen of the period there is not infrequent reference to the very probable natural origin of these phenomena. In support of this he cites from Chapter XX of the first book of Montaigne's *Essays*, that on the imagination, and in parallel column, ex-

tracts from Agrippa which suggest that the great essayist borrowed freely from his scientific contemporary. He quotes further, from Rabelais (*Le cinquieme et dernier livre de faits et dictz heroiques du bon Pantagruel*, Chapters XLIII et XLVIII), in the same tenor.

In his conclusion, Rouzeaud says, "Finally, we may make one statement with conviction. Hypnotism was known in the sixteenth century. The writings of Pomponazzi, Cornelius Agrippa, Paracelsus, Cardan, Van Helmont and Kircher prove this. Interest in scientific matters was so keen that these new ideas, stripped of their clumsy Latinity, were popularized by lay writers and dressed in plain language for the French public. Montaigne, Charron and Rabelais all speak of the mysterious power of the imagination, which, as they say, explains miraculous cures, puzzling nervous states and the art of sorcery. The power of the imagination can be exercised over the body in two ways: on the body of him who imagines, in which event it is autosuggestion, and on the body of another, which is real hypnotism. The learned doctors whom we have quoted were familiar with both states. Even at that early period the influence which a word or a sensation might have on the human body was clearly known and demonstrated. It must be admitted that Pomponazzi, as well as Agrippa, knew all the power of autosuggestion. They explained by its action the occurrence of certain skin lesions (stigmata), and the many cures which up to that time had been accredited to supernatural power. We have seen that Agrippa was the first to employ the word suggestion, and furthermore he has left in his work on occult philosophy a most interesting study of the curative power of the imagination, of ecstasy, anesthesia, hallucinations and somnambulism. He confirmed, in a passing way, the existence of mental suggestion at a distance.

"One finds in these writings the absurd alongside what is rational. These medical men who represented the *élite* of their time tell us seriously, for example, that a little fish called the remora was able to stop the progress of a great ship and that the eating of garlic would weaken the power of a lover. Be that as it may, is it just to condemn their work, *en bloc*, when we can find in the writings of profound men such as Aristotle and Pliny statements equally fantastic?" As stated in the beginning of this note, the interest which attaches to the writings of Dr. Rouzeaud is due to the little known authors whom he quotes and because he seems to demonstrate with unquestionable clarity that Charcot, Freud and others were not digging in virgin fields.

PHYSICIAN-AUTHORS: HENRY
VAUGHAN.

It sometimes happens that a man writes something or other exceptionally well which is not appreciated by his contemporaries, and that as a result he falls into obscurity after his death and has to be discovered in a later generation. This is what happened in the case of Henry Vaughan, the Silurist. Although Vaughan at his best was the greatest of seventeenth century religious poets of England, for more than two hundred years his writings remained almost unnoticed. Not even the numerous anthologies of British poetry made mention of him. But now it is different. He is in all the anthologies and a whole flock of critics never seem to tire of singing his praises.

Henry Vaughan was rescued from obscurity chiefly through the instrumentality of the poet Wordsworth and the Reverend Henry Lyte, best known as the author of the hymn *Abide With Me*. Wordsworth came into possession of a rare old volume of Vaughan's poems and was fulsome in his appreciation of the beauty of its contents. That brought the long neglected Vaughan to the front and created a demand for his work, with the result that a volume of selections, edited by the Reverend Mr. Lyte, was published in 1847. Since then there have been several publications of Vaughan's work, singly and in sets, and no library is complete without them. As recently as 1892 his complete works were published in this country.

Wordsworth admitted that Vaughan had a great influence on his work, and confessed that Vaughan's most famous poem, *The Retreat*, was the germ of the *Ode on the Intimations of Immortality*. Both men loved to brood on immortality and muse about death and both were passionately fond of Nature and all her works. This mutual love of Nature and deep interest in immortality figures conspicuously in the work of both writers and gives them more than a common kinship in the field of letters. Vaughan's poems abound in delicate descriptions of natural beauty and in the historic valley of the river Wye, where he was born and spent most of his life, there was an abundance of natural beauty to inspire a pen so gifted.

But why was Vaughan in obscurity so long? Perhaps the best explanation is given by Edith Sichel in the *Monthly Review*. Miss Sichel points out that intermingled with his gold is much base metal and that a great deal of what he wrote was dull, tedious and obscure. He did not keep a steady level, and it was by his faulty work, which bulked large against his perfect work, that his contemporaries judged against him. Miss Sichel, in line

with other critics, classes Vaughan with George Herbert, author of *The Temple*. "But Vaughan is more intellectual, more highly strung than Herbert," she says. "Where Herbert is pious Vaughan is mystical. . . . Vaughan's mind is subtler, loftier, more imaginative than Herbert's, and therefore often more farfetched. At his best, when emotion has worked him up to a white heat, none can be simpler than he, and he moves out into depths in a way George Herbert can never do. But when he is not fully inspired he is likely to grow elaborate; and where Herbert's homely simplicity goes straight to the heart and gives a loving welcome to the soul, Vaughan may have nothing to offer but an abstruse thought magnificently embroidered." Thus Vaughan holds his place today not for the mass of his work but for a few unforgettable poems that outshine all others of their kind.

The failure of his contemporaries to appreciate him discouraged Vaughan to such an extent that he quit writing early in life and confined his activities to the practice of medicine. All told he wrote five volumes of poetry and prose. The first was a volume of amatory and nature poems together with a translation of the *Tenth Satire of Juvenal*. His next volume was *Silex Scintillans* (Sparks from the Flint), a book of religious verse which contains the bulk of his masterpieces. This was followed by *Olor Iscanus* (The Swan of the Usk), his second book of sacred verse; *The Mount of Olives*, a book of private devotions; and *Flores Solitudinas*, which contained religious prose translations and *The Life of Paulinas, Bishop of Nola*. All these were written when he was between twenty-nine and thirty-four years old, and all, except the first, were of a devotional nature. Although he still had some forty years to live, henceforth he wrote nothing and published nothing. However, in 1678 his twin brother, Thomas, the noted alchemist, issued, without Henry's knowledge or consent, a volume entitled *Thalia Rediviva, the Pastimes and Diversions of a Country Muse*. The book consisted chiefly of amatory and pastoral poems which Henry had written early in life and had condemned to oblivion because of the lack of the religious element in them. Vaughan's religious fervor had deepened during a severe illness following the publication of his first book, and he turned absolutely away from worldly writings. Herbert's poetry, read during his convalescence, also deepened his religious convictions and molded the form of his future work.

Vaughan was a direct descendant of those royal Celtic princes of southern Wales whom Tacitus mentioned and whose abode in the days of the Roman domination of Britain was in the district

called Siluria. Vaughan always called himself "the Silurist." He and his twin brother were born on April 17, 1622, at Newton St. Briget, within the shadow of the ruined castle of Tretower, where their royal ancestors had held forth. Both brothers were active on the Royalist side during the civil war which ended in the triumph of Cromwell and both attended Jesus College, Oxford. Henry received his medical education in London, and began practising about 1645 at Brecknock, a country town near his birthplace, where he died at the age of seventy-three on April 23, 1695.

LARGE PLACENTAS AND SYPHILIS.

The problem to solve in regard to large placentas and syphilis is to ascertain if every child born with a large placenta should be regarded as a syphilitic and treated as such in future life. Recent researches, particularly those of Labourdette, seem to show that when syphilis is a certainty the placenta, far from being unusually heavy, only presents this condition in a relatively small number of cases, at least when the child is born at term and, secondly, if careful research is made for syphilis in women who have large placentas, the affection can rarely be detected. If all the children born at term were taken indiscriminately in the statistics published by either Blanchet or Labourdette, it will be found that out of a hundred and thirty-nine deliveries of females with unquestionable syphilis there was a large placenta in fourteen. If, on the other hand, we take all the Blanchet cases, it will be found that the average weight of the placenta to that of the child is 1:7, which is below normal and, according to Labourdette's statistics, the average ratio of the placental weight to that of the child is 1:5.8, corresponding to an increase in the weight of the placenta of thirteen grams above the average.

In these circumstances it would seem only logical to regard an increase in the placental weight to have no bearing whatever as to possible syphilis in parent and offspring. The exceptions are far too numerous to make large placentas a diagnostic sign of lues. In all of Labourdette's cases a Wassermann test was performed with the same antigen, namely, an alcoholic extract of the liver of an hereditary syphilitic fetus. The result of the Wassermann reaction in the offspring need not be considered, since in the newly born it has no value whatever. It is manifest that the results of the reaction in mother and child do not always agree, as Bar and Daunay have shown, and a negative reaction in a newly born infant does not mean that he is asyphilitic, even if he appears per-

fectly healthy. Likewise, the Wassermann may be frankly positive in an asyphilitic infant, especially when icterus is present.

In the mother, the Wassermann has only an absolute value when the spirocheta and its culture furnish the antigen and every element not of human origin has been removed from the reaction. These reservations made, it is probable that considerable value may be placed on the indications furnished by the Wassermann. It is evident that the number of positive Wassermanns attain their maximum in the secondary phase of syphilis—87 per cent. Brück, 92 per cent. Levaditi, 96 per cent. Blumenthal, 98 per cent. Blaschkeo, 100 per cent. Schmenfeld—and these figures are all the more important because the statistics relating to the question under consideration relate to a large number of cases. The age of the syphilis has a great influence over the Wassermann reaction, so much so that Kirschbaum maintains that it is positive in only sixty-eight per cent. of old syphilitics, but in Labourdette's statistics the negative results obtained in the mothers could not have been due to an old syphilis in a latent stage, because the average age of the women was twenty-three years.

A thorough, energetic treatment will render the Wassermann reaction negative and in the pregnant female with active luetic accidents, treatment will lower the number of positive reactions to less than fifty per cent. This does not, however, apply to Labourdette's statistics, because he only took those women into consideration who never had undergone antisyphilitic treatment in any form. In six cases this observer was able to corroborate the data obtained by the Wassermann with a very prolonged control of the infant. The six infants whose placental weight ratio was respectively 1:4.4, 1:4.5, 1:4.7, 1:4.6, 1:5.2, and 1:5.2, never presented the slightest evidence of syphilis. This may be a simple coincidence and it is certain that the results obtained would be much more conclusive had the number of infants been larger, but Labourdette only took into consideration those infants which he was able to follow beyond an age where syphilitic accidents would not be likely to appear. It might be said that the large placentas were due to syphilis in the father, and that, therefore, the mother would not offer any evidence of the infection, but Bauer's researches unquestionably show that Wassermann was positive in so-called immunized women, according to Colles's law. For all these reasons it is safe to rely on Wassermann's reaction. According to Labourdette's statistics it would appear that syphilis was rarely the cause of large placentas in eight women, as it occurred in only twenty-two and five

tenths per cent. of the cases and usually these were not unusually heavy placentas, so that as a sign of syphilis relatively little importance should be attributed to it, especially when the offspring is strong and vigorous. On the other hand, if the infant is puny and weakly, Wassermann reactions should be done to affirm the diagnosis in order to ascertain the true condition of affairs.

MIDDLE CLASS FERTILITY.

Our journals dealing with mentality, sane or insane, present today a delirious, bewildering set of charts of no use to anyone but the owner; that is, they need the author to explicate the waves traced apparently by an intoxicated thermometer. We advise those interested in *The Fertility of the English Middle Classes* (*Eugenics Review*, October, 1920) to leave the charts and take the conclusions, which are, that there is no essential difference between the fertility of university and nonuniversity women. Also, it is found that the mean size of the family is small and a considerable proportion of the parents restrict fertility, and the whole study of sampling middle class families has led to no result incompatible with the conclusions drawn by Karl Pearson and his collaborators from wider data of a different kind.

It is left to the reader to determine whether these results, or any results of wider analysis, suggest that neglect of eugenic principia is leading to a steady deterioration of the race or likely to influence the reproductive habits of the educated classes. There is much subject for reflection. We were sure that, having set out on exploring that horrible jungle revealed by the mental and moral condition of childbearing women in the criminal, mentally deficient, and poverty haunted classes; that the severely respectable, detached from the world's strife in a semidetached villa, would not long escape an analysis.

News Items.

Asthma and Hay Fever Clinic.—A public clinic for asthma and hay fever has been established at the New York Hospital. Dr. Robert A. Cooke is in charge of the clinic and will give treatments Monday and Friday afternoons.

The Mütter Lectures.—The Mütter Lecture on Surgical Pathology of the College of Physicians of Philadelphia, for 1920, will be delivered on Friday, December 10th, by Dr. J. C. Chalmers Da Costa, Samuel D. Gross Professor of Surgery, Jefferson Medical College of Philadelphia. His subject will be Paget's Diseases of the Bones.

Harvey Society Lectures.—Dr. Carl J. Wiggers, of the Western Reserve University, Cleveland, will deliver the fourth Harvey Society Lecture at the New York Academy of Medicine, Saturday evening, December 11th. His subject will be the Present Status of Cardiodynamic Studies on Normal and Pathological Hearts.

Personal.—Dr. and Mrs. Abraham Jablons, of New York, announce the birth of a son, Friday, November 26th.

Japanese Leper Colony in Need of a Microscope.—The Leper Colony at Kusatsu Mission, Japan, is urgently in need of a microscope powerful enough to detect leprosy bacillus. Should any of our readers know of anyone who would be willing to donate such a microscope, or where one could be purchased for a small price, we should be glad to hear from him.

High Death Rate in Austria.—According to press dispatches from Vienna, dated November 26th, deaths are exceeding births in Austria by 100 per cent. and the mortality rate is without parallel in history. This condition has resulted from the food shortage and the attendant undernourishment of the population, only a small percentage of the deaths being due to diseases not directly attributed to malnutrition.

University Course in Public Health Nursing.—A Department of Instruction in Public Health Nursing has been established in the University of Toronto in connection with the Faculty of Medicine. This course requires the attendance of graduate nurses at the university for one year. The Ontario Red Cross is providing ten scholarships of \$350 each, five of which are to be assigned to nurses who served overseas.

Medical Society of the County of New York.—At the annual meeting of the society, held Monday evening, November 22nd, the following officers were elected to serve for the ensuing year: President, Dr. George Gray Ward, Jr.; first vice-president, Dr. Orrin S. Wightman; second vice-president, Dr. Arthur F. Chace; secretary, Dr. Daniel S. Dougherty; assistant secretary, Dr. J. Millon Mabbott; treasurer, Dr. James Pedersen; censors for three years, Dr. Edward M. Colie, Dr. Gustav G. Fisch, and Dr. De Witt Stetten.

Medical Society of the County of Kings.—The following officers of the Medical Society of the County of Kings have been nominated for election at the next meeting of the society. Dr. Arthur H. Bogart, president; Dr. Frank D. Jennings and Dr. William V. Brinsmade, vice-presidents; Dr. Lewis P. Addoms, secretary; Dr. John Shields, associate secretary; Dr. Robert L. Moorehead, treasurer; Dr. Alfred Bell, associate treasurer; Dr. William Browning, directing librarian; Dr. William Webster and Dr. William Lindner, trustees.

French Surgeon Dies of X Ray Burns.—Announcement was made in Paris on November 29th that Dr. Charles Infroit had died from the effects of x ray burns. One of Dr. Infroit's hands became infected in 1898 as a result of his constant use of the x ray, and an operation was performed. Since that time he had undergone twenty-four operations, twenty-two of which were performed in the last ten years. The last was on August 1st, when his right arm and left wrist were amputated. Dr. Infroit was a celebrated surgeon, and his announcement in 1915 in the Academy of Medicine of Paris that he had extracted a bullet from the heart of a soldier was read with interest throughout the world.

American Child Hygiene Association.—At the annual meeting of this organization, which was formerly called the American Association for the Study and Prevention of Infant Mortality, the following officers were elected: Dr. Henry L. K. Shaw, of Albany, president; Mr. Herbert Hoover, of New York, president-elect; Miss Minnie H. Ahrens, of Chicago, and Mr. Sherman C. Kingsley, of Cleveland, vice-presidents; Dr. Harry F. Helmholz, of the Mayo Clinic, Rochester, Minn., secretary. Dr. Richard A. Bolt is general director of the executive staff and Dr. Philip Van Ieger is chairman of the executive committee.

Janssen Medal Awarded to American Physicist.—The French Academy of Sciences, Paris, has awarded the Janssen medal to William W. Coblenz, physicist in the Bureau of Standards, in Washington, for his discoveries in connection with rays emanating from the earth and stars. Mr. Coblenz has been attached to the Bureau of Standards for twelve years, and has developed a method of measuring radiant heat by infrared and ultraviolet rays. He has devised an instrument for astronomers with which to measure heat from the stars, and also developed in the course of the war signal instruments for ships at sea and an instrument for detecting moving bodies, such as ships, by their heat emanations in the dark.

Dr. Brush Commended for Relief Work in Near East.—Dr. Barton W. Brush, of Elmhurst, L. I., who for more than a year past has been engaged in relief work in Transcaucasia, has been commended by the Near East Relief, for his courage and devotion in refusing to abandon his post when the city of Kars, Armenia, fell to the Turkish Nationalists. Captain Ernest A. Yarrow, director general of the relief activities in the Caucasus area, said, in a letter to Dr. Brush, that he could not too highly commend him for remaining at his post in the very serious and dangerous crisis, and that on behalf of the Near East Relief he wished to express their profoundest gratitude and appreciation.

Red Cross League Appointments.—The following appointments are announced in the October *Bulletin* of the League of Red Cross Societies:

Dr. Hermann M. Biggs, health commissioner of New York State, has temporarily assumed the duties of General Medical Director, to succeed Dr. Richard P. Strong, who has resigned this position to resume his duties as professor of tropical medicine at Harvard University.

Dr. William H. Park, director of the Bureau of Laboratories, Department of Health, New York City, has been for several weeks in Geneva, where he has been giving assistance and advice regarding the work of the medical department.

Dr. William W. Francis, assistant chief of the Department of Medical Information, has been appointed editor of the *International Journal of Public Health*.

Professor George C. Whipple, who has been chief of the Department of Sanitation, is returning to the United States to take up his work again at Harvard University. He retains his connection with the League of Red Cross Societies in the capacity of consulting sanitary engineer.

Health Commissioners Attend Housing Conference.—Dr. Royal S. Copeland, Health Commissioner of New York, presided at a housing conference held in Detroit, Mich., last Tuesday and Wednesday. The health commissioners of thirty-three cities were in attendance. The conference was held for the purpose of determining so far as possible the exact effect on public health of the present housing situation in the United States. Dr. Copeland said that the survey of New York City had been completed by the Health Department, and that about 75,000 homes were visited.

Chief, Section of Medical Referees.—The United States Civil Service Commission announces an examination for Chief, Section of Medical Referees, to fill a vacancy in the Bureau of War Risk Insurance, Washington, D. C., at \$4,000 to \$6,000 a year. The duties of the appointee will consist of supervision of the Section of Medical Referees engaged in examining case files and making disability ratings based upon medical evidence contained in reports of physical examinations obtained from medical officers in the field, answering correspondence relative to claimants, and performing routine work connected with the medical aspect of claimants. Applications will be received up to January 11, 1921.

Meetings of Local Medical Societies.—The following medical societies will meet in New York during the coming week:

MONDAY, *December 6th.*—Clinical Society of the New York Polyclinic Medical School and Hospital; New York German Medical Society (annual).

TUESDAY, *December 7th.*—New York Academy of Medicine (Section in Dermatology and Syphilis); Clinical Society of Harlem Hospital; New York Neurological Society; Society of Alumni of Lebanon Hospital (annual).

WEDNESDAY, *December 8th.*—Medical Society of the Borough of the Bronx; New York Pathological Society; New York Surgical Society; Alumni Association of Norwegian Hospital (annual); Brooklyn Medical Association.

THURSDAY, *December 9th.*—New York Academy of Medicine (Section in Pediatrics); West End Clinical Society (annual); Brooklyn Pathological Society.

FRIDAY, *December 10th.*—New York Academy of Medicine (Section in Otolaryngology); Eastern Medical Society of the City of New York (annual); Flatbush Medical Society; Society of Externs of the German Hospital in Brooklyn.

Died.

DAY.—In Waterloo, N. Y., on Monday, November 15th, Dr. John W. Day, aged seventy-four years.

FERRACO.—In Southampton, L. I., on Thursday, November 25th, Dr. Almedes F. Ferraco, of Brooklyn, N. Y., aged twenty-seven years.

HOPKE.—In Brooklyn, N. Y., on Tuesday, November 23rd, Dr. F. E. Hopke, aged forty-six years.

KIRKPATRICK.—In Philadelphia, Pa., on Sunday, November 21st, Dr. Andrew B. Kirkpatrick, aged sixty-six years.

KNAPP.—In Brooklyn, N. Y., on Friday, November 26th, Dr. Mark Israel Knapp, aged fifty-two years.

LUCE.—In Oneonta, N. Y., on Tuesday, November 16th, Dr. Daniel Luce, aged fifty-seven years.

MCBEAN.—In Los Angeles, Cal., on Friday, November 12th, Dr. Anna G. McBean, aged thirty-seven years.

MYERS.—In Twin Falls, Idaho, on Friday, November 12th, Dr. J. P. Myers.

SPRAGG.—In Wheeling, W. Va., on Sunday, November 21st, Dr. Sylvanus L. S. Spragg, aged sixty-eight years.

THORN.—In Deerfield, Mass., on Friday, November 12th, Dr. Edwin C. Thorn, Jr., aged forty-six years.

WALP.—In Philadelphia, Pa., on Thursday, November 18th, Dr. George L. Walp, aged forty-four years.

Book Reviews

VACCINE TREATMENT.

Practical Vaccine Treatment. For the General Practitioner. By R. W. ALLEN, M. A., M. D., B. S., Late Captain, N. Z. M. C. New York: Paul B. Hoeber, 1920. Pp. xii-308.

Dr. Allen pleads for a fair hearing. For many years he "preached the doctrine of doses capable of exciting a reaction, of doses and intervals controlled by close clinical observation." He hopes a strict observation of his methods will help reconstruct vaccine treatment and enable it to take its rightful position as the most truly scientific therapeutic agency in the doctor's armamentarium. He very politely but definitely shows Sir Almoth Wright's definition of a vaccine to be the classic one, but cumbrous, now inaccurate, and in the future likely to be more so. Sir Almoth, quoted, says: "Bacterial vaccines are sterilized and enumerated suspensions of bacteria which furnish, when dissolved, substances which stimulate the healthy tissues to a production of specific bacteriotropins, substances which fasten upon and directly or indirectly contribute to the destruction of the corresponding bacteria." They are not, says Allen, always sterilized, nor always enumerated. Sera, again, are often confused by many with vaccines, whereas the immunity a serum brings about is passive—that by vaccines active.

As to the aim of vaccine treatment, he says: "The injection of a vaccine into healthy tissues results in the elaboration in the tissues of certain protective substances inimical to the wellbeing of these particular microbes which is being injected. This process we imitate when vaccinating the human subject—we exploit the healthy tissues in the interest of those which are infected and unhealthy."

He particularly emphasizes that the protective substances elaborated by the healthy tissues in response to the stimulus of the introduction of a certain microbe, are highly specific, i. e., of protective use only against that particular one. Thus, the *Bacillus typhosus* only avails with the *Bacillus typhosus* and holds no protection against the paratyphoid fevers. Many doctors, not realizing this, are often greatly disappointed with results.

Immunity against several microbes must be treated with a combined or compound vaccine. The first used—then much derided—was the author's own, though several imitations got on the market and the most worthless was adopted by the military authorities for Army use. It has been proved that the combination has the same effect as using separate bacilli for each microbe.

Prophylactic inoculation, too, has made great strides, evidenced by the successful fight against some dozen diseases by the author himself, though he had a wearying fight for the use of the combined vaccines during the Boer War, thousands of men being rendered unfit for service. Castellani was with him finally, and other bacteriologists. He alludes to the successful treatment of that strong enemy, rheumatoid arthritis, of which no one has yet succeeded in finding a specific bacterial origin, though it has for causative factors toxins derived from bacteria resident somewhere in the tissues, its

vaccine treatment must be that dealing with the associated primary focus of toxic absorption. This is given. There are useful chapters on Therapeutic Immunization and one of actual questions asked and the answers given. Diseases of the circulatory system, the genitourinary system, the intestinal tract, and ductless glands, are some of the interesting studies presented. Because written by an eager fighter and not by a mere looker on, the book is vital and merits both praise and a good welcome.

THE NEW PHYSIOLOGY.

The New Physiology in Surgical and General Practice. By A. RENDLE SHORT, M. D., B. S., B. Sc. (Lond.), F. R. C. S. (Eng.), Examiner in Physiology for the F. R. C. S., etc. Fourth Edition, Revised and Enlarged. Illustrated. New York: William Wood & Co., 1920. Pp. xi-291.

Many new editions do not justify their existence, the new pages being culled by subordinates and insufficiently edited, and the fresh original matter is not important enough to tax the purse of an impecunious doctor who conscientiously tries to have the very latest in his library. But men must have found what they sought in the three previous editions of this physiology, the revisions must have been honestly done, or a fourth would not have been sure of a welcome.

The first chapter is on food deficiency diseases, emphasis being laid on the fact that a capability for living even a long time on little does not prove the wisdom of so doing, nor that of keeping to a certain quantity, if the quality is not nourishing.

The old questions of rice polished and unpolished are ventilated, also that of lemon and lime juice as an antiscorbutic. Babies and lion cubs, where causes of rickets were investigated, were found to have had too much starch and sugar and too little fat and protein. The cubs, by the way, had been fed on London cab horse—doubtless the babies had had some, too—and anyone who is familiar with the appearance of that curious animal will doubt its efficiency as diet, the tires of a motor car being quite as satisfactory. In Greenland's icy mountains, where babies are given and vocally emit, plenty of blubber, rickets do not exist.

The author alludes, in his chapter on Researches on Blood, to the greater researches in America as compared with those in Britain, particularly when writing of an enemy during the war which had only been scotched, not killed, in civil practice, and now wrought havoc, that is, secondary hemorrhage. He speaks of the still active efficacy of red corpuscles kept for two or three weeks in an ice chest, confirming Rous and Turner's experiments. On one occasion, forty pints of blood, including one from a wellknown surgeon, were sent to him at a casualty station just before the battle of Cambrai. It was stored in ice, in a citrate-dextrose solution. In a week, the supernatant plasma was drawn off, as it might have proved dangerous after keeping, and the blood used was just as efficacious as that which was fresh.

Surgical shock, though illuminated by the flaring torches of war and studied by the best young brains

in Europe and America, leaves the surgical world not much nearer solving some of its problems, and this Short frankly admits, though he rewrites the chapter, giving the best of the newer knowledge. It is this comfortable stating in each chapter what to expect that is new and where only a clearer stating of the old can be given which renders the book valuable as a reference. From the great junction of physiological problems there are starting new trains of thought every year. How far they will safely run, wherewith they will connect, depends partly on the capable study by young men of the work already done, and in Short and the men whose names he gives, much help will be found, much weariness in research avoided.

TUBERCULOSIS.

Zeitschrift für Tuberkulose. Unter Mitwirkung der Herrn Prof. BABES (Bukarest), Prof. BANG (Kopenhagen), Geh. Med. Rat. Dr. BEHLA (Charlottenburg), Dr. LEO BERTHENSEN (St. Petersburg), und so weiter. Herausgegeben von M. KIRCHNER, F. KRAUS, W. V. LEUBE, J. ORTH, F. PENZOLDT. Leipzig: Verlag von Johann Ambrosius Barth, 1920. Seiten 64.

The editorial office of the *NEW YORK MEDICAL JOURNAL* has recently received a copy of the *Zeitschrift für Tuberkulose*, published by Johann Ambrosius Barth, Leipzig, Germany. To the best of the reviewer's knowledge, this is the first copy which has reached this country since we entered the world war. We welcome it again because of the quality of its contributions. In the number before us, being issue No. 1 of Vol. 33, October, 1920, there are two excellent articles on Chest Wounds and Pulmonary Tuberculosis. Dr. O. Seitler, who wrote the first article comes to the conclusion that a tuberculous lesion is much more likely to become activated as the result of the trauma than has been heretofore noted. In the second article by Dr. Gerhard Frischbier, these conclusions are confirmed. He makes the statement that even an absolutely latent case of pulmonary tuberculosis frequently becomes active as the result of a bullet wound.

Another article in this number treats of tuberculosis of the kidney, and others are devoted to antigen therapy and the symptomatic forms of chronic tuberculosis. Interesting is a contribution, by Gruber, of Mainz, concerning a number of post-mortem examinations on tuberculous French negro soldiers of the Army of Occupation. The author comes to the conclusion that in these African tuberculous patients the tuberculous infection almost invariably follows in the direction of the lymphatic vessels and that pneumoconiosis has not then appeared in their lungs. The remainder of the magazine is devoted to reviews of contributions on the subject of tuberculosis from all over the world. In prewar times original contributions in English and French appeared side by side with German articles in this magazine.

Authorities from nearly all the allied countries and former Central Powers are still mentioned as coeditors, only France is not again represented since the death of the great Landouzy. The managing editors of the *Zeitschrift* are Prof. Dr. A. Kuttner and Prof. Dr. Lydia Rabinowitsch; the latter is particularly well known to American tuberculosis

workers from her former residence in Philadelphia. The *Zeitschrift für Tuberkulose* is up to date in all its contributions and it is to be hoped that when peace will at last again unite the science of medicine throughout the civilized world, the magazine will again be the avenue for the interchange of ideas for the welfare of tuberculous sufferers.

THE DUODENAL TUBE.

The Duodenal Tube and Its Possibilities. By MAX EINHORN, M.D., Professor of Medicine at the New York Post-Graduate Medical School; Visiting Physician to the Lenox Hill Hospital, New York. Illustrated. Philadelphia and London: W. B. Saunders Company, 1920. Pp. xiii-122.

Originally Dr. Einhorn perfected the duodenal tube for the purpose of having a convenient method of diagnosis. Recently the field of usefulness for the tube has been extended so that it may be used therapeutically. Much light has been shed upon the nature of the secretions in the vicinity of the duodenum by the use of this method. Some of these findings have been presented by Dr. Einhorn from time to time in the *NEW YORK MEDICAL JOURNAL*. In the hands of a careful worker like Dr. Einhorn it has proved to be a most useful appliance. It has proved to be a useful adjunct in diagnosis to the x ray, stomach pump and duodenal bucket. Another useful purpose the tube serves is as a conductor of alimentation to the patient. Stretching of the pylorus by means of the pyloric dilator has also proved of value, as well as stretching of the cardia in impermeable cardiospasm.

The book is replete with illustrations showing the various methods of application for the tube, as well as x ray photographs showing the tube in various parts of the intestinal canal. The illustrations in color show specimens of normal and abnormal duodenal contents after they have been removed by means of the tube.

LIFE.

Life. By JOHAN BOJER. Translated from the Norwegian by JESSIE MUIR. New York: Moffat, Yard & Co., 1920. Pp. 339.

Life. Our first impressions, our first fears, have more to do with death than with that more mysterious state, life. Death and far off things were studied more by the ancients than life and self. More recently man has begun seriously to be introspective. So Bojer, who comes to us with worthy studies translated from the Norwegian, attempts the presentation of a few of the actions and reactions of a certain group of people and calls it life. Let the title stand; we shall endeavor to follow him and see what he has to do.

He gathers up an armful of characters and shows us how they behave under certain stressful conditions. Here, one has an old grudge, a captain in the army; his fellows go on to advancement while he remains a captain. The world is against him, all are plotting to prevent his promotion. He seeks a retreat and plans revenge. He draws plans for the reorganization of the army, he compensates for his inferiority, he is greater than all the generals, he who has been overlooked and downtrodden. In this half fantasy world he finds his haven of refuge. In his defeat during the struggle with reality and in

his retreat he drags others down with him; his son and daughter. But they too have their difficulties aside from their environment and the heritage from their paternal ancestor. The difficulties of his daughter's mother while not depicted are alluded to frequently. She too finds the struggle for existence and expression a difficult one and at a critical period yields to one man while she transforms him through a process of mental imagery, reinforced by circumstance, into the man she really cares for. This momentary weakness hangs like a heavy cloud over her and when finally she achieves her dreams of marriage to the man she really loves, and emancipation, she finds herself too weak to face the situation and, through an unconscious process, solves her problems through a foolhardy adventure in a small boat. Her minor difficulties were met by white lies and evasions, each one leaving her weaker and less able to meet the real problems when they came up to her for solution.

With great skill Bojer shows how the weaknesses of one character involve the lives and happiness of all who with them may happen to come in contact. Those who refuse to stand on their own feet push down others upon whom they lean. Bojer's sketches are like dry point etchings, clear cut and not flamboyant. His hope for a newer and finer social structure, which he bases on the development of men and women by their interest in healthful outdoor living and an interest in things beautiful, is all very well but he completely ignores changes in social structures and environmental factors which go so far in determining the conditioning of all human beings. He contends that the individual is always stronger than his environment and can model his life as he wills. This may be true in certain, or if he will, in many individual cases, but no matter how finely he may divide iron the specific gravity will always be greater than water. It is true that ice will sustain iron and a ship made of iron will float, but the ice one day will melt and the ship, one day, may leak. While we may not agree on all points with the philosophy of our Norwegian author, we must admit the power of his writings and grant him a place among the foremost novelists of today. He has not exactly presented life to us; just a few of the problems of man; just a few, but important ones nevertheless.

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

DIABETES. A Handbook for Physicians and Their Patients. By PHILIP HOROWITZ, M.D. With Twenty-Seven Text Illustrations and Two Colored Plates. New York: Paul B. Hoeber, 1920. Pp. xii-196.

SHORT TALKS ON PERSONAL AND COMMUNITY HEALTH. By LOUIS LEHRFELD, A.M., M.D., Agent for the Prevention of Diseases, Department of Public Health, Philadelphia, with an Introduction by WILMER KRUSEN, M.D., LL.D., Director (1916-1919), Department of Public Health and Charities, Philadelphia. Philadelphia: F. A. Davis Company, Publishers, 1920. Pp. xii-271.

THE HYPHEN. By LIDA C. SCHEM. In Two Volumes. New York: E. P. Dutton & Co., 1920. Pp. 1052.

HUNGRY HEARTS. By ANZIA YEZIERSKA. Boston and New York: Houghton Mifflin Company, 1920. Pp. 297.

CAIUS GRACCHUS. A Tragedy. By ODIN GREGORY. With an Introduction by Theodore Dreiser. New York: Boni & Liveright, 1920. Pp. 172.

THE JEWISH FAIRY BOOK. Translated and Adapted by GERALD FRIEDLANDER. With Eight Illustrations in Color by GEORGE W. HOOD. New York: Frederick A. Stokes Company, 1920. Pp. 188.

SATAN'S DIARY. By LEONID ANDREYEV. Authorized Translation Never Before Published in Any Language, with a Preface by HERMAN BERNSTEIN. New York: Boni & Liveright. Pp. xvii-263.

THE BRIDE OF CORINTH AND OTHER POEMS AND PLAYS. By ANATOLE FRANCE. A Translation by WILFRED JACKSON and EMILIE JACKSON. London and New York: John Lane Company, 1920. Pp. xv-285.

EINFÜHRUNG VON EMIL ABDERHALDEN. Halle a. d. Saale, nebst einer vollständigen und ausführlichen Inhaltsübersicht der 13 Abteilungen des Gesamtwerkes. Berlin-Wien: Urban & Schwarzenberg, 1920. Seiten 84.

THE STORY OF DOCTOR DOLITTLE. Being the History of His Peculiar Life at Home and Astonishing Adventures in Foreign Parts. Never Before Printed. Told by HUGH LOFTING. Illustrated by the Author. New York: Frederick A. Stokes Company, 1920. Pp. 180.

HOOKEWORM AND MALARIA RESEARCH IN MALAYA, JAVA, AND THE FIJI ISLANDS. Report of Uncinariasis Commission to the Orient, 1915-1917. By S. T. DARLING, M.D.; M. A. BARBER, Ph.D., and H. P. HACKER, M.D.. Publication No. 9. New York: The Rockefeller Foundation International Health Board, 1920. Pp. x-191.

A HISTORY OF THE CONCEPTIONS OF LIMITS AND FLUXIONS IN GREAT BRITAIN FROM NEWTON TO WOODHOUSE. By FLORIAN CAJORI, Ph.D., Professor of History of Mathematics in the University of California. With Portraits of Berkeley and Maclaurin. Chicago and London: The Open Court Publishing Company, 1919. Pp. viii-299.

AN INTRODUCTION TO BACTERIOLOGY FOR NURSES. By HARRY W. CAREY, A.B., M.D., Assistant Bacteriologist, Bender Hygienic Laboratory, Albany, N. Y. (1901-3); Pathologist to the Samaritan (Troy) and Cohoes Hospitals, and City Bacteriologist, Troy, N. Y. Second Revised Edition. Philadelphia: F. A. Davis Company, Publisher. English Depot: Stanley Phillips, London, 1920. Pp. vii-149.

REFRACTION AND MOTILITY OF THE EYE. With Chapters on Color Blindness and the Field of Vision. Designed for Students and Practitioners. By ELLICE M. ALGER, M.D., F. A. C. S., Professor of Ophthalmology at the New York Postgraduate Medical School, etc. With One Hundred and Twenty-five Illustrations. Second Revised Edition. Philadelphia: F. A. Davis Company, Publishers. English Depot: Stanley Phillips, London, 1920. Pp. xiv-394.

PRACTICAL MASSAGE AND CORRECTIVE EXERCISES WITH APPLIED ANATOMY. By HARTVIG NISSEN, President of Posse Normal School of Gymnastics; Superintendent of Hospital Clinics in Massage and Medical Gymnastics; For Twenty-four Years Lecturer and Instructor of Massage and Swedish Gymnastics at Harvard University Summer School, etc., etc. Fourth Revised Edition, with Sixty-eight Original Illustrations, Including Several Full Page Half Tone Plates. Philadelphia: F. A. Davis Company, Publishers. English Depot: Stanley Phillips, London, 1920. Pp. xii-225.

OCCUPATIONAL AFFECTIONS OF THE SKIN. Their Prevention and Treatment. With an Account of the Trade Processes and Agents which Give Rise to Them. By R. PROSSER WHITE, M.D. (Ed.), M. R. C. S. (Lond.), Life Vice-President, Dermatologist, Senior Physician, and Ethetic Officer, Royal Edward Infirmary, Wigan; Vice-President, Association Factory Surgeons, etc. Second Edition. With Twenty-four Plates (Comprising Twenty-eight Figures). New York: Paul B. Hoeber, 1920. Pp. xiv-360.

Practical Therapeutics and Preventive Medicine

A Compendium of Treatment and Prophylaxis, Original and Adapted

Dilatation of the Lateral Ventricles as a Common Brain Lesion in Epilepsy.—Dr. A. Thoms (*Journal of Nervous and Mental Disease*, January, 1920) finds from observation that dilatation of the lateral ventricles is a common abnormality of the brain in epileptic subjects, but fails to find in literature mention of this phenomenon. A study of the brains of seventy-five epileptic subjects made during the past seven years showed that seventy-six per cent or fifty-seven cases had gross brain lesions. Thirty-one of these fifty-seven cases presented cortical lesions as well as dilated ventricles, sixteen showed lesions of the cortex alone, and fourteen had dilated lateral ventricles, though the cortex looked normal. In the cases with cortical lesions the hind part of the brain, especially the occipital lobe, was most frequently affected. General cerebral gliosis involving the entire cerebrum was the next most frequent manifestation. Softenings, usually localized, were noted in surprisingly few instances.

The dilated ventricle group comprising forty-one cases, or 54.6 per cent, showed abnormalities of the cortex in twenty-seven brains, which cortical lesions were the probable cause of the convulsions. The ventricular dilatation in the remaining fourteen cases in which there was no cortical involvement, raises the question as to whether lesions affecting primarily the white matter may not be a factor in producing epilepsy. A summary of the ages at which convulsions began in the group with both dilated ventricles and cortical lesions showed that the onset occurred before twenty years of age in sixty-three per cent of the cases, whereas it occurred at this period in only forty-three per cent of the cases in which there were no cortical lesions. In cases presenting dilated ventricles without cortical lesions the greatest number of onsets after thirty years of age occurred.

The Therapeutics of Essential Epilepsy.—L. Pierce Clark (*Boston Medical and Surgical Journal*, September 30, 1920) says that in handling the individual epileptic it is first necessary to analyze the specific conflicts which he has to meet in life and note his type of mismanagement of them. Then consciously to increase the patient's insight into the situation is absolutely necessary. It has been the custom so long merely to note the epileptic defect and not make him aware of his own inherent fault that this method alone is almost revolutionary. Heretofore this kind of autognosis, or selfknowledge, has been left to wellmeaning friends, nurses, religious instructors or tutors, and has not been brought into the physician's own armamentarium. Perhaps it has been held to be of so little medical importance, or that the process of wise teaching entailed has been thought to be so time consuming that the physician has neglected his plain duty. But since the newer principles of reeducation and psychoanalysis in the neuroses have been established, similar methods are really found to be of service in

essential epilepsy. Proceeding with this method sooner or later one finds that the epileptic individual possesses a crude type of personality. No explanatory talk about his character defect will remove it.

Essential epilepsy in its inability to be analyzed away demonstrates that it is not a neurosis but a profound disorder of the instinctive life. Analysis but points out the glaring defect and it is then possible to lay down a daily schedule of character training and practice in concrete instances wherein the epileptic may learn day by day, little by little, the means of overcoming his faults of character. Analysis only points out the specific reeducation possible. In many instances notes of the analyzed defects should be taken by the patient himself or summarized by the teaching physician so that the epileptic individual may go over it again and again. He is likely to forget the explanatory talks as a protective mechanism common to all humanity. The fit itself obliterates the imprint of the corrective advices. Thus it would seem that the epileptic seizure is a magic talisman in more than one direction. It reduces the sting of the affective stress which springs the epileptic reaction. Be it fit or explosive temper, it carries off the keenness of the epileptic initiation of helping himself and obliterates the teachings formerly given him.

Potassium Borotartrate in Epilepsy.—Pierre Marie, Crouzon and Bouttier (*Bulletin d'Académie de médecine*, June 1, 1920) report clinical tests demonstrating that boron compounds, and in particular potassium borotartrate—sometimes termed soluble cream of tartar—exert an effect in epilepsy much like the bromides, but without the drawbacks attending the use of the latter. A marked reduction in the intensity and frequency of the seizures was obtained. Potassium borotartrate occurs in transparent scaly crystals, colorless, with an acid taste, and very soluble in water. Where, owing to a change in the molecular condition, the solubility diminishes, it can be promptly restored by treating the compound with hot water. The dose of the drug administered was generally three grains a day, given in three tablespoonfuls of the following solution: Potassium borotartrate, twenty grams; chemically pure glycerin, ten grams, and distilled water, enough to make three hundred mils. This dose could, if necessary, be largely increased, as formularies generally give the dose of potassium borotartrate as a purgative as twenty to thirty grams a day. In the clinical tests, ten chronic epileptics, previously under prolonged observation and many of them no longer amenable to bromides, were given three grams a day of either the salt mentioned, sodium tetraborate, or ordinary borax. As with bromides, the benefit appeared first as a transformation of the seizures to mere dizziness, and later by progressive diminution of the intensity of the latter. The average number of seizures a month in these ten patients was 30.5 before the boric treatment, eighteen

during the first month of treatment, 11.5 during the second month, and nine in the third month. Only once or twice was there any vomiting, and when it occurred it yielded promptly to cessation of the drug, as did also looseness of the bowels. An important advantage over the bromides was the entire absence of any evidences of mental depression by the drug, which seems to act directly upon the primary pathological cause of epilepsy rather than by depressing the nerve centres. The fact that three grams of potassium bromide contain two grams of bromine, whereas three grams of potassium borotartrate contain only 0.155 gram of boron, also points to a different mode of action on the part of the two agents. Possibly the boron acts after the manner of a catalyzer. Potassium borotartrate was well borne, alike in children and aged individuals, but borax sometimes brought on eczema. The former agent is almost invariably to be preferred to borax or sodium tetraborate. The latter, however, gives better results than borax. Favorable clinical effects were likewise obtained in traumatic epilepsy and in epilepsy due to brain tumor.

A Consideration of the Aftercare in Arrested Cases of Essential Epilepsy.—L. Pierce Clark (*American Journal of the Medical Sciences*, October, 1920) concludes as follows: 1. So-called cures or arrests in essential epilepsies are brought about only by the most thoroughgoing and prolonged plan of neurological and hygienic training treatment in which reeducation is the basic factor. 2. Relapses in arrested cases occur through negligence or disregard of the essential factors. There is renewed and intensive physical and mental stress and proper and appropriate medical supervision should be continued throughout the lives of such individuals. Such a plan of aftercare in private and institutional practice would greatly diminish the possibilities of relapse. 3. A more or less enduring arrest and cure in essential epilepsy may be considered permanent when the environment and life reactions as regards the secondary epileptic reactions are approximately normal. No mere cessation of epileptic fits under sedatives should be held out as an enduring arrest unless the individual shows a corresponding absence of epileptic reactions.

Sympathetic Disturbances in the Upper Extremities in Middle or Lower Dorsal Involvements of the Spinal Cord.—J. A. Barré and R. Schrapf (*Presse médicale*, April 28, 1920) call attention to certain disturbances, in all likelihood of sympathetic origin, which occur in the upper extremities and are caused by a lesion of the spinal nerve roots not in the cervical but in the middle or lower dorsal region. These disturbances affect the ulnar area of the extremities and especially the last fingers. They may constitute a forerunner of a spinal symptom complex and precede the oncoming of paralysis of the lower extremities. Failure to recognize the site of the disturbance in the middorsal region may lead to mistaken localization in the cervicodorsal region of a pathological cause actually located between the sixth and eleventh dorsal segments. In the presence of these apparently sympathetic disturbances, the possibility of a lesion of the spinal nerve roots in the dorsal region should be borne in mind.

The Significance of Meningeal Symptoms.—A. C. Eastman (*Boston Medical and Surgical Journal*, October 28, 1920) says that meningeal symptoms are frequently present in many of the infections of childhood and may represent either a meningism or a meningitis. Unless definitely positive of some diagnosis besides meningitis, the only means of determining their significance is by lumbar puncture, which, in many cases, requires several repetitions before a definite diagnosis can be made. Like other laboratory examinations, the findings in the cerebrospinal fluid must be considered in conjunction with the clinical progress of the disease. In the final analysis we must depend upon the bacteriological examination to furnish a positive diagnosis.

Cause and Prevention of Overstimulation of the Modern American Child.—Erik St. J. Johnson (*Boston Medical and Surgical Journal*, October 28, 1920) asserts that the automobile, the motor boat, graphophones, pianolas, and cinematographs, together with wrongly proportioned extravagance in ambition and money, in schools and in homes, are all, in certain ways, seriously harmful to the existence and development of normal children. Chiefly so in that unless used with more than average care and forethought, they render children dissatisfied with normal home life. There, and there only, are laid the true foundations for natural strength and lasting qualities in mind and body. Though economic checks, such as the high cost of living, and future shortage of gasolene, are bound to operate before long in the line of general stabilization, medical men should use every opportunity to warn parents of the causes and evil results of overstimulation of children outside the home. Children need a less hurried, more simple existence in order to build up lasting qualities.

Acute Myoclonic Encephalitis.—Sicard and Kuddelski (*Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, January 29, 1920) describe a recently observed clinical condition characterized by lassitude and malaise, severe lancinating pains in all parts of the body, a rise of temperature to about 38° C., and occasionally slight headache. After about a week there appear brief, quick, explosive muscular contractions of the limbs, face, and diaphragm, sometimes localized in one portion of the body. The myoclonic seizures affect a single entire muscle or group of muscles, and are not accompanied by fibrillary contractions. The pains in various parts and the slight fever persist. There is no eye symptom or somnolence; as a rule, insomnia is present. About the third week slight delirium appears. The reflexes, objective sensibility, and pupils remain normal. In the terminal stage, lasting three or four days, speech becomes difficult and jerky. There are automatic gestures, nearly continuous delirium, lessened intensity of the myoclonic seizures, and finally coma and death. The cerebrospinal fluid is nearly normal; at times, particularly toward the close of the case, it shows slight albuminosis and lymphocytosis. The Bordet-Wassermann test of the spinal fluid and blood is negative. In one case the myoclonic seizures were followed by paresis of the extensors in the upper extremities.

Intravenous Injection of Ammoniacal Copper Sulphate Solution in Puerperal Sepsis.—H. Noiré (*Presse médicale*, June 5, 1920), at Manté's behest, treated an apparently hopeless case of puerperal sepsis by this measure and was amazed to see the patient recover. He later employed the treatment in three other cases, with like success. The ammoniacal copper sulphate yields absolutely clear solutions if not made more dilute than four per cent., whereas solutions of ordinary copper sulphate, whether concentrated or dilute, are always turbid and sometimes cause reactions similar to those following injections of the colloidal metals. The ammoniacal copper sulphate solution mixes in all ratios with blood serum without causing the least turbidity, and its intravenous administration awakens no reaction. The preparation of the solution consists in placing anhydrous copper sulphate and ammonia water in a bottle so as to form a saturated solution, the bottle being meanwhile corked. An equal volume of ninety per cent. alcohol is then added, the two liquids being separated by dialyzing paper. After twenty-four hours, crystals of ammoniacal copper sulphate are formed. These are rapidly dried in blotting paper, after having been washed with alcohol, and are kept in well stoppered bottles. In injecting the solution, care should be taken that all of it passes into the vein, as the least amount passing beneath the skin will cause sloughing. In puerperal fever the author injects two mls of the solution, i. e., eight centigrams of the salt, morning and evening, until the temperature descends to normal.

Injury of Intraabdominal Viscera.—Frank T. Fort (*International Journal of Surgery*, September, 1920) in a plea for early surgical intervention in unrecognized wounds of the intraabdominal viscera presents the following arguments: The increasing frequency with which preventable fatalities are observed from injury to intraabdominal viscera accompanying external trauma without production of positively indicative local or general symptoms, should cause every conscientious practitioner of medicine to indulge in serious introspective study and reflection: the medical man, because he oftentimes first sees the injured individual and much depends upon the promptness and thoroughness of his investigation and his diagnostic and prognostic acumen; the surgeon, because upon his diagnostic confirmation, his technical ability and keen surgical sense will usually depend the life (or death) of the individual.

It is important that an accurate history of the accident be obtained in every instance where external abdominal trauma has been inflicted: the nature of the traumatizing agent, the attitude of the individual when injured, the exact anatomical region implicated, the probable force and direction of the violence, and the time with relation to food ingestion. The data thus collected should be carefully considered in connection with existing local and general symptoms in estimating the possibilities of coincident internal injury. The pertinent fact must not be forgotten, however, that extensive visceral damage may be produced by apparently slight external trauma; also, that there may be no coincident internal damage despite violent external injury.

There being no pathognomonic early signs by which visceral injury may be recognized, early accurate diagnosis is often delayed or rendered impossible. This fact, however, is unimportant since it is the imperative duty of the surgeon to intervene provided there exists even presumptive evidence of internal damage. Procrastination more often than otherwise means a fatal issue, and properly executed celiotomy is practically devoid of clinical risk. Where visceral damage has occurred the mortality under expectant treatment is nearly 100 per cent. as illustrated by statistics cited.

Promptly instituted surgical intervention, based upon suspicion or presumption of internal injury after exhausting reasonable efforts to complete an accurate diagnosis, with adequate repair of visceral damage when such has occurred, should markedly reduce the unreasonably high mortality prevailing in the class of cases under discussion. The dictum "the earlier operative treatment is instituted where visceral injury has occurred, the greater the probability of saving the life of the individual," should be accorded more consideration than has hitherto obtained.

Diagnosis and Treatment of Hydrocephalus.—Walter E. Dandy (*Surgery, Gynecology and Obstetrics*, October, 1920) discusses the diagnosis and treatment of hydrocephalus resulting from strictures of the aqueduct of Sylvius and presents the following conclusions: 1. Cicatricial stenosis of the aqueduct of Sylvius is the most frequent lesion in congenital hydrocephalus (about fifty per cent.), and is found in a large percentage of cases of hydrocephalus occurring in infancy and early childhood. It may occur (though rarely) in adult life.

2. Hydrocephalus always follows occlusion of the aqueduct. The third and both lateral ventricles progressively dilate. The fourth ventricle, being posterior to the obstruction, does not enlarge.

3. In the gross, the occluded aqueduct appears to be replaced by a fibrous tissue which microscopically is neuroglia. Microscopic remnants of the aqueduct are usually but not invariably found.

4. The stenosis may occupy the entire length of the aqueduct, or varying parts; it may be only a thin even transparent membrane. Again, the stricture may be only partial.

5. Strictures of the aqueduct of Sylvius can be diagnosed and accurately localized. The indigo-carmin test will indicate that an obstruction is present; ventriculography will be the means of precisely locating the obstruction.

6. Spontaneous relief is not possible. Surgical attempts to drain the fluid from the third ventricle to the exterior of the brain have all proved futile. The openings invariably close and the fluid cannot absorb in the subdural space.

7. A surgical procedure is suggested which is directed toward the cause. A new aqueduct of Sylvius is constructed; a tube is left in place for two to three weeks. It is hoped the epithelium will regenerate and establish a new canal.

8. This operation has been performed in two cases, both patients recovering from the operation. One patient died of pneumonia several weeks later, the second seemed well one year after the operation.

Rôle of Cancellous Tissue in Healing Bone.—

T. Wingate Tood (*Annals of Surgery*, October, 1920) gives the following résumé of his studies of the rôle of cancellous tissue in bone healing: 1. Cancellous tissue is one of the chief agents in regeneration of bone, and like the cambium layer of periosteum, should be treated at operation in the most conservative manner, consistent with thorough exploration and drainage. 2. In regeneration the cancellous tissue nearest the midlength of the bone grows most rapidly, whereas that in or near the articular extremities shows less readiness to proliferate and fill the cavity. 3. Septic bone cavities should be permitted to heal from the bottom, the wound in the soft tissues being kept widely open until this has occurred. The least possible mechanical disturbance of the cancellous tissue should be employed and no disinfection of the cavity attempted, for this simply kills the remaining tissue from which regeneration is expected. 4. Regenerating bone is very sensitive to and easily affected by pressure, even of soft tissues, and by inefficient drainage. It is not adversely affected by the ambulatory method of treatment. 5. Compact bone plays a very minor part in regeneration.

Gonococcemic Pseudomalarial Fever.—M. Bloch and P. Hébert (*Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, March 4, 1920) report the case of a man aged twenty-five in whom various clinical features, such as pseudomalarial fever, arthralgia, and maculonodose and even purpuric eruptions, reproduced precisely the picture of meningococcemia as described by Netter, Marie, and others. Attention not having been drawn at the beginning to an existing chronic gonorrhoea, and the blood culture having revealed a gram negative coffee grain diplococcus, intensive antimeningococcic serum therapy was at once instituted, but yielded no results. On the other hand, injection of a vaccine made from the germ found in the patient's blood brought about rapid recovery from the septicemia, though the genitourinary foci apparently failed to benefit from it. In such a case the diagnosis could be made only by agglutination tests, the diplococcus from the blood being found inagglutinable by antimeningococcic serums though agglutinable by antigenococcic serum. The complete failure of antimeningococcic serum in this case would seem to negative the good results claimed for it in gonococcal arthritis by certain observers.

Treatment of Fracture of Femur.—Moorhead (*Surgery, Gynecology and Obstetrics*, September, 1920) gives the following treatment for fracture of the femur: 1. Treatment of fracture of the femur starts with first aid designed to place the limb at rest in traction in a Thomas splint, or in traction straps with weights attached. Ambulance surgeons and first aid men should be supplied with Thomas splints. 2. The patient and not the fracture will demand most attention in the feeble or diseased. 3. Any method that does not combine reduction with early massage and motion fails to give the maximum service. 4. The former idea that deformity and disability are inevitable in femur fractures should be abandoned. 5. Two attempts at reduction should be made before skeletal traction

or open operation is performed. 6. For the non-displaced and reducible group, plaster of Paris (spica or molded) is an efficient form of splintage. 7. In the irreducible group described, skeletal traction by transfixion offers a safe, efficient method. 8. This fracture entitles the patient to a high grade of surgical care and exacts from the surgeon a degree of diligence and skill at least equal to that necessary in the management of many other major surgical problems. 9. Fractures have been too much slighted by surgeons and for that reason the fracture field is being encroached upon by orthopedists who by their training are better fitted for the aftercare than for the initial care of this acute variety of traumatic surgery. 10. There is great need for standardization and uniformity in fracture work and in no group is this more necessary than in fractures of the femur.

Intoxication from the Rectum.—L. Dreyfus (*Presse médicale*, February 18, 1920) states that the possibility of intestinal intoxication by bacterial toxins or toxic products resulting from the decomposition or putrefaction of proteins has not yet been experimentally demonstrated. He has personally succeeded, however, in demonstrating experimentally the possibility of intestinal intoxication by acids. This occurs almost exclusively in the large intestine, and chiefly in the rectum. Clinical occurrence of such a condition may be considered very probable, as there exist in the feces many acids which might give rise to it. Under normal conditions the stools should be neutral in reaction. The principal factors that may render them acid are a too copious or exclusive carbohydrate diet and insufficient secretion of bile. These conclusions open up a new field in the treatment of acute or chronic intestinal intoxication and the disturbances of health dependent upon such intoxication.

Treatment of Carbon Monoxide Intoxication.—Léon Binet (*Presse médicale*, May 15, 1920) emphasizes the fact that the simplest and best plan of treatment in this condition is to break down the carbon monoxide hemoglobin *in vitro*. The combination of the gas with hemoglobin is an unstable one, which can be broken up by oxygen provided the latter is administered in pure form, as shown by Nicloux. Achard has pointed out that inhalation of pure oxygen is capable of yielding a maximum therapeutic effect from the start in this condition. The respiratory capacity of the blood comes back to normal under these conditions and cannot be further raised by a second inhalation of oxygen gas. It is never too late in a case of carbon monoxide poisoning to use pure oxygen, for even several days after the intoxication the poison is displaced from the hemoglobin combination just as readily as it is immediately after the intoxication. The richer the air respired in oxygen, the more rapidly the displacement of carbon monoxide from the combined hemoglobin will proceed. Giving oxygen through the usual cannula held in front of the patient's mouth and nose is definitely insufficient in these cases. A chloroform mask or emergency pasteboard mask must be used, and if the gas is inhaled in large amounts, recovery may be procured within a few minutes.

Proceedings of National and Local Societies

NEW YORK NEUROLOGICAL SOCIETY.

*Three Hundred and Seventy-ninth Regular Meeting,
Held March 2, 1920.*

The President, DR. WALTER TIMME, in the Chair.

Chronic Nondegenerative Hereditary Chorea.

—Dr. I. S. WECHSLER presented a case showing a clinical picture closely resembling Huntington's disease, but certain distinctive features removed it from that category and suggested that it might be a distinct clinical entity. An American, female, married, aged thirty-six, had had peculiar movements of arms, hands, body and legs, twitchings of the face, for some sixteen years, gradually increasing in intensity for a time, then remaining comparatively unprogressive. A slight weakness of the heart, with faintness, was complained of about the time of the onset, which was said to have followed a miscarriage. There were no convulsions, biting of tongue, nor amnesia. The attacks were closely linked with the patient's emotional state, suggesting a possible hysterical condition. The patient's father, who was the uncle of her mother, also suffered from chorea for twenty years. One brother had shakings. Of her children one daughter was not nervous, but had poor eyesight and nystagmus; the second daughter had twitching and attacks of weakness. The shaking was not choreic. Two small boys had chorea and nystagmus.

The patient showed a number of abnormal involuntary movements; irregular, jerky, purposeless movements of whole parts, arms, legs, body, hands; twisting of the whole body. The eyeballs wandered in irregular fashion in their sockets. All these movements were intensified by emotion, while control inhibited them for a short time. The movements were in general more rapid than in chorea. No pathological reflexes were found. Vision and hearing were normal, except for the choreic nonrhythmic movement of the eyes. Mental status was perfectly normal, with a slight tendency to forgetting, probably due to lack of attention.

In the oldest boy, aged nine and a half, a condition diagnosed at the hospital as acute chorea developed at the age of seven. The condition improved somewhat after six months, but two years ago there was a second acute attack. The younger boy, aged six, had had slight twitchings since he was three. Slight unsteadiness in equilibratory and nonequilibratory tests, of a choreic nature, was obtained on examination. Some nystagmus on looking forward and trying to fix the gaze was also noted.

Unlike the condition usually met with in Huntington's chorea the onset of the attack was at the early age of twenty. The movements were quicker, the face showed more grimaces, speech was differently affected, somewhat forced and slow but not scanning. The gait was clownish. Mental degeneration was absolutely absent. Hysteria might be adduced as a cause, especially hysteria associated with chorea, while other forms of chronic chorea, such as chorea gravidarum and paramyoclonus

multiplex, had features suggestive of this case, but did not correspond sufficiently to warrant the diagnosis. The point of particular interest in this case was that it was a nondegenerative, nonprogressive type of hereditary chorea.

Hyperthyroidism in a Girl Nine Years of Age.

—Dr. MORRIS H. FRANTZ presented a case which he considered was of interest because of the infrequency of the condition in children. The patient had come to the Neurological Institute clinic a year before. She was fidgety, would get into rages, and had palpitation on violent exercise. Muscular sthenia, ocular manifestations and a distinct exophthalmus were present. Tachycardia and slight tremor of the hand were also noted. Laboratory findings were negative; mental age was twelve and a half.

The patient's father had had rheumatic arthritis, the mother suffered from hyperthyroidism. Goitre had been present in a maternal aunt. The child was born in a little town in Germany where goitre was prevalent. At the time of the child's birth a goitre developed in her mother, and the same condition was diagnosed in the child at the age of one and a half. The condition became aggravated at the time of the emigration of the family to America during the submarine blockade.

Acute Infectious Myoclonus Multiplex and Epidemic Myoclonus Multiplex.

—Dr. J. RAMSAY HUNT called attention to the problem of localization of acute infections in some part of the nervous system. The varieties of clinical types in Heine-Medin's disease, for instance, emphasized the fact that certain strains of the same infective organism might have special affinities for certain tissues of the nervous system, and thus bring about the special clinical type of reaction. Such special forms of localization of an acute infection, he said, were to be found in acute infectious myoclonus multiplex and epidemic myoclonus multiplex. The form was characterized by lancinating pains, muscular contractions and twitchings, and a delirium of toxic origin. This group of symptoms, Doctor Hunt found, constituted a well defined clinical type of neural infection which differed from those previously recognized and was encountered both in sporadic and epidemic form.

The onset of the disease was acute and was characterized by shooting pains of great intensity in the trunk and extremities. Spinal pains were sometimes present. The pains were followed by characteristic muscle jerks, waves and twitchings (myoclonus multiplex, myokymia, and fibrillary contractions.) The contractions made their appearance first in the parts where the pains were first felt. A week might elapse in some cases between the appearance of the pains and the myoclonus and myokymia. The twitchings were bilateral, multiple, and might become generalized. There was sometimes a tendency to localization in certain regions of the body, especially in the abdominal musculature. The contractions were quick and of

short duration, individual muscles or portions of muscles were involved, but not synergic groups. Slight movements of the toes, fingers, and extremities might occur in severe myoclonic twitchings, but never to the extent found in chorea or cortical myoclonia.

There was usually moderate fever. In some cases that proved fatal the temperature rose in the later stage of the disease. An acceleration of the pulse rate was noted and, in most cases, a delirium which varied in duration and intensity with the degree of infection. There was often marked hyperidrosis, and the degree of sweating seemed to bear some relation to the activity of the myoclonus phenomena. There was no paralysis or paresis of any muscle or group of muscles; no anesthesia was encountered with the exception of occasional transient areas of hypalgesia. There was no ataxia nor loss of deep sensibility; tendon reflexes were present and active. Rarely the knee jerks might be diminished and the Achilles jerks absent during the height of the disease. The cranial nerves showed no evidences of involvement except for the myokymic twitchings. The optic nerves were normal. Skin reflexes were present and equal (no Babinski). When abdominal myokymia was present, the abdominal reflexes were exaggerated.

Doctor Hunt had observed twelve cases of this affection in the past sixteen years; two cases were seen more than ten years ago, and the remaining ten within the last three months. The first cases were evidently sporadic, the latter epidemic. The distinguishing features, acute pain of lancinating variety, with muscular waves and twitchings, were always present. Delirium was present in eight of the cases. The myoclonus delirium was a characteristic toxic delirium with hallucinations, illusions, and transitory delusions. Restlessness, insomnia, apprehension, disconnected thought and mental confusion were present. Apathy and a tendency to stupor were sometimes met with in the late stage. In the four cases without distinct delirium there were insomnia, restlessness, irritability and excitement in this early stage and later a tendency to apathy and dulness.

That an infectious disease was under discussion was clear from the character of the onset, the fever and delirium. Multiple neuritis and acute poliomyelitis might be excluded as diagnoses since the paralysis or weakness of the muscles associated with these diseases was absent. There was no appreciable tenderness along nerve trunks. Dubini's disease might also be excluded since it involved paralysis. Epidemic encephalitis or lethargic encephalitis were especially interesting possibilities. The epidemic myoclonus multiplex probably belonged to this group and represented a special myoclonus type of the affection. The infectious agent of epidemic encephalitis and epidemic myoclonus multiplex was apparently the same.

The motor and sensory symptoms of the disease studied by Doctor Hunt were only irritative in character, in spite of the very severe and sometimes lethal infection of the nervous system. There was no paralysis or anesthesia, and this fact gave the disease an added interest, since the myoclonus

symptom complex was not found in other forms of spinal and neural infections.

Two Cases of Brain Tumor.—Dr. C. C. BELING, Dr. H. W. Martland, and Dr. W. B. Eagleton reported on the neurological findings, the pathology and autopsy results, and the surgical procedure respectively, in two cases, the first, tumor of the pineal gland, which was presented as a clinical entity, the second, cerebellar tumor, presented as a pathological and clinical entity. The first patient, a man aged twenty-five, an experimental engineer with negative personal history, suffered superficial burns of both corneas in an explosion of barium chlorate in 1913. Recovery was complete. In October, 1913, he began to see double, and lenses and general treatment failed to produce any improvement. In March, 1919, an examination by Dr. Eagleton showed R. V. 20/100. L. V. 20/50. There existed marked papillitis of the right optic nerve, diplopia as a result of paralysis of the superior rectus of the right eye, and a spontaneous nystagmus. There was an increasing difficulty in looking upward. When Doctor Beling examined this patient the papillitis of the right optic nerve was very marked. There was no deviation of the tongue or tremor. Knee jerks and plantar reflexes were normal except for a slight tendency to slow reaction on the right side in the latter. On May 15th the patient contracted grippe and was sick from that time on. From July 1st a dull pain in the top of his head with slight frontal headaches persisted. His mental condition seemed to deteriorate. He was often nauseated and vomited. He could walk for a short time, then his body would stiffen and his head jerk back.

A left subtemporal decompression was performed by Dr. Eagleton. The brain was under great tension, the dura widely exposed. The operation was followed by an uninterrupted recovery, and the man's condition improved, although the papilledema persisted. Several weeks later, however, greatly increased intracranial pressure was apparent, and for the first time he showed a tendency to fall backward. The examination at this time showed an intense double papilledema. There was generalized tremor, with profuse hyperidrosis and tonic contraction of the muscles. Knee reflexes were exaggerated. There was clonus of the toes. Mental state was somewhat confused, he had lost track of dates, but knew the year and that he was in a hospital. Cerebration was difficult and tremor was produced by attempts to answer questions. Priapism was noted; no abnormal psychosexual phenomena. His condition became steadily worse, the tremor increased, eyes bulged, jaws were set. On November 8th he began to have convulsions in rapid succession, with profuse perspiration, and he began to grow cyanotic. He died a few hours later.

Slides of the hospital history and the autopsy findings were shown by Doctor Martland. The diagnosis had been tumor of the midbrain. It was found, however, that there was a small psammoma of the pineal gland. An enormous dilatation of the third ventricle had resulted. The pineal gland was visible in the x ray. Doctor Eagleton in discussing the surgical features of this case pointed out how

useless further decompression would have been. The possibility of a pineal gland tumor had never been suggested, since the usual symptom of headache was lacking. Relief for the increased intracranial pressure was sought by the left sided decompression earlier in the case, since Doctor Eagleton had come to the conclusion that the patient was left handed. But this had had no effect on the papilledema.

The second case, one of cerebellar tumor, was in a man of forty who began to lose weight, vomited every morning, had increasing dizziness, and began to see double. There were severe headaches. Examination by Doctor Befing showed slight swelling of r. papilla, vertigo, ataxia, and asynergia of the right side; deviation to the right on walking; nystagmus with rapid movements to the left and slow to the right. Hearing was about equal. Symptoms pointed to a lesion in the posterior chamber, subtentorial pressure. There was probably a cerebellar tumor with slight involvement of the pons since the left face and hearing showed slight affection.

Doctor Eagleton noted the following phenomena: The patient showed a Romberg; spontaneous pointing deviation of the right hand to the right; more marked spontaneous nystagmus on looking to the right. Rotation to the right produced nystagmus and possibly to the left, though whether spontaneous or induced could not be determined, duration apparently about eighteen seconds. Rotation to the left produced nystagmus of fifteen seconds' duration. There was deviation of both hands to the left; no dizziness in either rotation. Cold caloric in the right produced no nystagmus, no past pointing, or dizziness. Cold caloric in the left had no effect either. Nystagmus could be induced by turning the head backward, showing that tracts of the vertical canals were not functioning while the horizontal were functioning.

The tumor was thought to be pressing somewhat on both sides. Cases of this sort, Doctor Eagleton felt, where the exact nature of the tumor was not recognized were better left unoperated.

Trauma and Other Nonluetic Influences in Paresis.—Literature, Dr. MICHAEL OSNATO said, could yield practically nothing on the question of the influence of trauma in the production or precipitation of neurosyphilis, in view of the brief time that it had been possible to diagnose the condition. From a study of the very few cases that could be included under this category at the Vanderbilt Clinic in the past three or four years since careful histories had been kept, and from Doctor Osnato's own files, only thirteen cases could be assembled for study. These were all proved cases, proved either by laboratory examinations or by autopsy. This deficiency of cases in which trauma was an associated factor whether recognized or not, was to be noted in Southard and Solomon's *Case History Series*, where a few cases only were mentioned. The posttraumatic paresis usually occurred, these authors stated, citing Mott's study of the same subject, after at least a week's interval, since the time required for the destruction in the brain productive of the necessary symptoms would seem to

be at least that. Three months was the limit of time that Southard felt should be set to determine the influence of trauma as a causative factor. An increase in the number of cases of neurosyphilis during the war noted by the Canadian medical officers was thought to have been due to the great strain at the front, and the frequent physical injuries resultant upon being buried, etc.

A possible influence in the production or stimulation of paresis was accordingly granted by other observers. Doctor Osnato described the following cases in support of the traumatic theory: In a patient who had been struck on the back of the head eighteen months before by a heavy object, mental inefficiency soon became apparent. The only mental signs presented were perseveration of thought and speech and memory defect. The physical signs of paresis were present. A second patient, in whom the trauma was emotional, had been entirely efficient and dependable in his work until he was drafted into the army. His mental reaction was like a war neurosis in every respect. After his diagnosis as a psychoneurotic and after his discharge he continued to fail and finally came to the clinic complaining of gross memory defects, fifteen minute attacks of amnesia, dullness and retardation amounting almost to negativism, loss of interest. The mental picture was that of a psychoneurosis of the phobic type; a diagnosis of general paresis was made from investigation of the blood and spinal fluid. The problem of the emotional factors in the production of this condition was forcibly introduced here. The study must be speculative since the exact physiological changes that might take place as a result of fear or other emotions were not known.

In a third patient, a woman, the paretic picture developed after a prolonged etherization. Following an operation she complained of pains in the chest, legs, and abdomen, and right upper extremity. Grave memory defects also appeared. The physical signs of tabes were present, but mentally the patient was a general paretic. She was under treatment and showed progressive mental deterioration, without delusions or hallucinations. The fourth patient had a severe attack of influenza and complained of lancinating pains in the right arm and both legs shortly after. She became depressed, slept badly, had tremor of face, hands and tongue, was ataxic, and had a moderate memory defect. The blood Wassermann and spinal fluid findings in this case were those of a cerebrospinal syphilis rather than general paresis. Before the attack of influenza she had been perfectly well. In the last patient cited the trauma had been caused by a falling plank which struck the right parietal skull and glanced off striking the dorsal region of the spine. He was in Bellevue Hospital three days. There was evidence of a depressed fracture of the right vault of the skull in the frontoparietal region, over the Rolandic area. Left hemiplegia had developed when he left the hospital. A few days later there was unsteadiness of gait, ataxia, Romberg, typical paretic speech, stuttering memory defect, tremor. The initial hemiplegia was undoubtedly due to the trauma. Up to the date of his injury he had worked

steadily, and had shown no apparent signs of paresis.

In conclusion Doctor Osnato emphasized the fact that there were undoubted acute and chronic pathological lesions of the brain ascribable to trauma of the head. Something seemed to alter the permeability of the blood vessels of the brain, thus enabling the attack of the spirochetes upon the brain tissue. In the cases described craniocerebral injury seemed to have precipitated cases of paresis or adversely influenced them. The toxin of influenza, infections, or ether, might have an effect similar to trauma, while the effect of emotional stress offers food for interesting investigation.

Meeting Held on April 6, 1920.

Familial Dystonia Musculorum of Oppenheim.

—Dr. ISADORE ABRAHAMSON presented three patients from one family with dystonia musculorum of Oppenheim. The progressive stages of the disease were singularly well demonstrated. They were of the pure idiopathic variety, noteworthy, first, for their definite familial character; second, for their resemblance in the deviations from type that are to be met with in all familial diseases; third, for a distinct involvement of speech, which Oppenheim denied in his cases; fourth, for the involvement of the musculature of the neck not common in these cases; fifth, for the varying mental attitude in the three patients, and sixth, for the unusual propulsive phenomenon which had not previously been noted in cases of this sort.

The first patient, a Russian woman aged twenty, with unimportant family and personal history, at the age of twelve experienced difficulty in writing and became clumsy in her gait. The muscles of her legs would stiffen, this stiffening gradually spreading to other muscles and increased by effort or emotion. On attempting to grasp an object a coarse tremor appeared. Her symptoms had become aggravated during the last three months so that she could neither sit nor walk. During sleep all symptoms disappeared. The muscles were hypotonic. There was no paralysis. An abnormal wrinkling of the forehead existed and general anxiety, which was a deviation from the usual Oppenheim manifestations. Speech was dysarthric, bulbar type. The legs were paraplegic, were usually kept crossed, the typical inward rotation of the thigh was clearly apparent, and the feet were turned down. A marked involvement of the neck was of interest, the Adam's apple was prominent, and she showed torticollis. Dystonia, tortipelvis, lordosis, clonic movements of the left hand with tonic movements in legs, and a rhythmical tremor characterized the disease in this patient.

In the second sister, aged eighteen, the disease had an insidious onset. She first noticed difficulty in writing, her muscles began to stiffen involuntarily, the left arm was drawn up in a flexor spasm, and the hand turned outward. She complained that the hip joint on the right would not stay in place, and a drawing feeling above the knee was experienced which produced in her a type of propulsion that was very interesting. Her body was thus bent forward and laterally twisted around the

vertical axis of the spine. There was inward rotation of the thigh. The gait was bounding. Her condition was much improved when she felt well and rested.

The third member of the family, a boy of fifteen, showed the disease in its early stages. He had the inward rotation of the thigh, the toes pointed down, the heel was carried high. This condition had been getting slowly worse for the last two years. His first difficulty was also with writing. In walking he swished his foot, and there was a very slight forward bend. He could run well but had difficulty in stopping. Some hand movements could be accomplished, such as threading a needle and playing marbles. A fine tremor was noted. Scoliosis and tortipelvis were present.

The three patients showed interesting differences in emotional states. The first was extremely anxious, emotional, and worried about her condition. The second was optimistic and wanted to get well. The boy was apathetic, had no interest in his condition, and in general showed the mental state usually found in such cases, which caused them sometimes to be classed as hysterics.

Dr. SMITH ELY JELLIFFE expressed the opinion that it had been a rare opportunity for himself, and also, he thought, for other members of the society, to have presented in so thorough a manner the developmental history of this interesting syndrome. It was unique to have three members of a family showing the beginning, middle, and developed phases as had been demonstrated. Doctor Abrahamson had mentioned Ziehen's familial group, which Doctor Jelliffe had had the good fortune to study in Berlin. There were three in that group also, and Schwalbe's monograph had presented the features, but in Ziehen's group the disorder had progressed to a more or less uniform pattern and no developmental study was possible such as the present presentation offered.

Doctor Jelliffe was disposed to emphasize the varying clinical trends of a larger group of striatum syndromes of which these cases were but one of the striking types. It had become increasingly evident that dystonia musculorum, Vogt's double athetosis, Westphal's pseudosclerosis, Wilson's lenticular degeneration, Huntington's chorea, tuberous sclerotic idiocy, and even paralysis agitans were to be regarded as but variants in this larger picture of striatum syndromes.

It was recalled that one of Ziehen's patients had come to autopsy and negative findings had been reported, but more recently one of Flatau and Sterling's cases had been autopsied and Thomalla, Schneider, and v. Economo had respectively studied the striatum pathology and the liver, for the case of Flatau and Sterling had afforded a combination of the Ziehen-Oppenheim group of dystonia musculorum types and Wilson's lenticular degeneration types, since the clinical picture was characteristic of the former trend, while the hypertrophic sclerosis of the liver was of the Wilson lenticular degeneration type. The pathological picture of the striatum was one of an abiotrophic atrophy of the cells of the putamen.

(To be concluded.)

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THE FACULTY AND THE STUDENT.*

BY JOHN A. FORDYCE, M. D.,
New York.

Many classes at this time are striving to find their proper place in the partially reorganized and transitional state of society. Under the pressing demands of war a comparatively short time was required to enlist the man power, the technical knowledge and skill of the country to meet the national emergency. The mental and physical forces necessary to organize and achieve were direct and effective. The problems which were so promptly and efficiently met and solved by our profession in war times were no more serious than those arising in the reconstructive era through which we are now passing.

The after war reorganization of existing social conditions requires no less the directing force of a dominant idea. It must first of all take cognizance of the individual as influenced by his education, work, environment, and recreations. The large percentage of young men rejected by our draft boards as unfit for military service points to something radically at fault in the education and physical training of the youth of our country.

The prosperity and contentment of each class in a community means the prosperity of all. When this fundamental fact is generally recognized the search for a universal cureall for real or imaginary ills will be unnecessary. Although the mutual obligations and responsibilities of nations, classes and individuals have largely been lost sight of in their immediate requirements and ambitions, a condition of stable equilibrium must sooner or later take place, for the biological law of the trend to the normal applies to groups no less than to individuals.

Inventive genius developed by the demands of war is further stimulated in many of the former belligerent countries by dire necessity and will help to counteract the discontent and disorganization which are now not conducive to logical thinking or orderly behavior. Optimism should be the prevailing note. It can be made real by individual and class cooperation. The medical profession must follow the lead of modern psychologists and endeavor to comprehend the fundamental reasons for the present social unrest and help to direct the public mind into normal instead of pathological

channels. If medical opinion is influenced by great political events, our era should be marked by a study of the individual reaction to present day problems.

From the student bodies in our institutions of today are trained and developed the teachers and leaders of public thought of tomorrow. Bodily ills are often less dangerous than the fancies and bizarre theories of minds distressed or diseased. The one affects the individual; the other may imperil the integrity of the nation.

Knowledge of the fundamental facts of science, correct economic ideas and logical methods of thinking, can do more to correct false theories of life than the delusions and quack remedies of so-called reformers. By reason of his intimate and confidential relations with all classes in a community the physician may administer not only to disease of the body, but often can direct his patients in matters of public policy and antidote mistaken social theories. Concerted efforts of medical men to achieve reform for the public good are often successful because they are unselfishly advocated and because professional politicians regard not only the individual but the group influence they can bring to bear both in and out of the profession.

The practitioner is not a mere dispenser of drugs nor a technician skilled in removing offending organs. He is an educated scientist whose advice is often invoked in questions of individual and public welfare. In addition to healing the sick, he should anticipate and endeavor to prevent disease. He should know the psychology of childhood as related to heredity, environment and proper feeding, and advise as to the best educational methods to be employed in the impressionable age of the young. He should be able to anticipate educational misfits, and limit the failures too often resulting therefrom. He can "minister to minds diseased" and learn from faith curists valuable lessons in psychotherapy. These are some of the qualifications necessary for the educated physician of today, in addition to the technical subjects which confront the entering student and the practical branches which complete his four years of work.

The education acquired by the medical student aside from its practical application is a useful and liberal one. Knowledge of the fundamental sciences preparatory to practical medicine is as well worth while as that acquired by the engineer, the lawyer, or the theologian. The structure and functions of

*Address delivered September 22, 1920, at the opening of the session 1920-21 of the College of Physicians and Surgeons of Columbia University.

the human machine and its living variabilities offer more intricate and interesting problems in chemistry and physics than those confronting the engineer in metallurgy, mining, or in the building of bridges.

Is it not worth while to know something of the organ which directs all intellectual and physical endeavor; which retains and coordinates the impressions of centuries; originates infinite combinations, and expresses them in works of art, immortal prose and poetry, and changes the crude materials of nature into magical shapes? The study of mental phenomena in health and disease opens the door to many obscure problems in the social relations of mankind and concerns not only the psychiatrist but the statesman and all who have to do with their fellowmen. A conception of the individual reaction to his surroundings means much to the teacher and his pupil. It develops in the one a more intimate and sympathetic attitude and a corresponding desire in the other to profit by the teacher's advice and instruction.

The study of medicine in its varied relations appeals to minds inclined to abstract and speculative reasoning, to the research worker, who is chiefly concerned in looking for causes and is constantly demanding the reason for things, as well as to men who are only interested in the concrete and obvious. In addition to the development of the power to observe and interpret it broadens one's viewpoint, awakens the logical sense, and stimulates the desire to penetrate further into the great mystery of life.

It is as much the duty of the instructor to teach the student to think clearly and reason logically as to convey facts or discuss theories. Inability to examine evidence in a critical manner, and to form independent judgments, leads too often to blind acceptance of the dictum of one who occupies a position which gives him the reputation of an authority. The written and unwritten history of medicine is replete with theories of disease, systems of cures, and operative procedures, based on immature knowledge, wrong interpretation of facts, and hasty generalizations. More accurate knowledge of the fundamental sciences and a wider grasp of pathological processes have revealed the limitations of our art, and should make us more conservative in accepting new methods of treatment.

The delightful paper by our colleague, Dr. Karl Vogel, on Oliver Wendell Holmes and the Medical Student, recalls to all of us one who was not only a great physician, a philosopher and a poet, but a logical thinker, and one honest enough to expose the humbugs, inconsistencies, and crudities of drug giving as practised in his day. The collateral reading of every student of medicine at some time during his early years should include his medical essays and especially his paper on the Contagiousness of Puerperal Fever, published in 1843, long before our knowledge of the bacterial cause of disease. It is a model of such careful collection and interpretation of facts, and clear and logical reasoning, that it now seems impossible to comprehend the bitterness, scepticism and opposition which it evoked among the obstetricians of that day. Refusal to accept demonstrated truths when opposed to preconceived ideas was not confined to days gone by. We see

it too often in minds guided only by precedent and tradition.

The motives which have led you to begin the study of medicine would perhaps be difficult for you to analyze. Inherited bent, love of science, the desire to be a member of a learned profession, dislike of the routine of a business life, may be some of the reasons why you are here today. The preliminary work required, and the crowded curriculum which awaits you, mean serious work, and it is reasonable to assume you desire the best instruction it is possible to obtain and are willing and desirous to cooperate with your teachers to secure it. Your work has a definite aim. You are striving to become practitioners. Some will doubtless acquire a love for research work, and will devote their lives to that. Others may find they have made a mistake in selecting an uncongenial profession, or for other reasons may not be able to complete the outlined course. No matter what the future may hold for you, an impression on your minds and characters will result from your work and associations.

Modern teaching methods correct some of the defects of medical instruction in the past, but we are yet in a state of evolution. Each year the public demands a higher type and better educated practitioners. They can only be supplied by public cooperation and support. The growth of the pure sciences with resulting multiplication of methods in diagnosis and treatment demands more laboratories, additional apparatus, and, above all, accurately trained instructors.

Individual gifts, endowments and liberal facilities in our public hospitals for clinical instruction and the study of autopsy material are needed to further the work of the student and to train the future instructor.

The student should be as familiar with the terminal stage of disease processes in death as with the more subtle chemical reactions which take place in life. The cycle of knowledge which should form our complete picture of disease is as imperfect without the one as the other.

Our present day means of imparting information is chiefly by experiments and concrete demonstrations and less by didactic lectures. The textbook sources from which lectures are usually compiled are at all times accessible to the student. Laboratory work, individual study and interpretation of problems of disease, and demonstration of autopsy material are more tangible than the finesse of rhetoric or the skilled oratory of the professor.

In speaking of the medical teaching today, it is difficult to avoid a certain amount of retrospection (a sure indication of old age). It may be worth while, however, to contrast briefly medical teaching as now conducted with conditions as they existed more than forty years ago.

Many subjects which have to do with medicine as a whole are in a state of flux. What is considered knowledge today is discarded tomorrow. Some theories have become established facts, others have been scrapped. All, however, have served a useful purpose, and have proved to be stepping stones on the road of progress.

Since the earliest days of medical instruction, I imagine, the prospective student has always been regarded as fortunate in beginning his work in a progressive age. He has been told by his teachers that had they been accorded the same facilities he now enjoys, their own careers would have been more successful and brilliant. These encouraging words will probably be made to the future pupils of our present undergraduates, and will be heard with the same polite scepticism. Many who practise medicine today are handicapped by lack of knowledge of the fundamental sciences, which have made such astonishing progress in the last fifty years. Medicine can now be placed among the exact sciences, but it is always progressive and will always present new problems to be solved. No matter how many cases of one type of disease are seen, variations in the picture are always present. Medicine will, therefore, never lose its interest to the mind which observes and asks the reason why.

Changes have taken place in the methods of teaching as well as in the subjects taught. Formerly the medical student was talked to by his teachers and told about all things in the curriculum. Now he is not only instructed by word of mouth, but does things with his hands. He conducts experiments and sees the relation of cause and effect. When only one sense is appealed to, the mental impression is not deep enough to be permanent. Modern methods develop the student, but afford less opportunity to develop the oratory of the teacher. Many of the spectacular and picturesque features of teaching have given way to more intimate, direct and effective ways.

During the forty odd years which have elapsed since my student days in medicine, the new sciences of bacteriology, serology and immunology have developed with their profound influences in all branches of our art. Organic chemistry, then only taught in the most elementary way, has been enormously elaborated and now supplies the key to many obscure problems in physiology and pathology. The manipulation of chemical substances made possible by a knowledge of their graphic formulæ has resulted in substitution products and many valuable therapeutic agents. It has made possible the new science of chemotherapy. If one seeks magic in medicine it can be found in the final achievement of the life work of Paul Ehrlich.

What is more remarkable in its benefit to the human race than the specific selective action of a chemical agent on a given type of disease producing organisms? The culmination of Ehrlich's work, the products of a scientific mind stimulated by scientific imagination, has given to the world a cure for syphilis, yaws, and relapsing fever. It is not alone the achievement in question, but the fundamental principle established, which opens the way for results equally as important and brilliant.

Scientific research has developed laboratory aids in diagnosis and treatment which have made the guesswork of former years the certainty of today. One procedure alone—the Wassermann reaction—has revealed the enormous importance of syphilis as an etiological factor in hitherto unsuspected conditions. It is an invaluable aid in the diagnosis of

all stages of this protean infection and is equally important as a criterion of cure.

In our zeal and enthusiasm for exact technical procedures we should never forget the prolonged clinical study, keen observation and ability to interpret symptoms of disease which formed so large a part of the attainments of the older practitioners. The clinical acquirements of centuries are an indispensable part of our present day knowledge.

If we were to eliminate from medicine the contributions of the clinician, our profession would be poor, indeed. The discoveries of the pure scientist were often anticipated by the clinician and furnished the former the incentive for his work. Tuberculosis was considered an infectious process and its clinical picture was almost complete before Koch's discovery. Fournier's clinical acumen enabled him to recognize the syphilitic factor in tabes and paresis. His observations have been fully confirmed by the laboratory worker. Examples along these lines might be multiplied indefinitely if we had the time or inclination to defend a useless thesis as to the relative superiority of the one or the other method. Both are needed. They supplement each other. The experienced teacher neglects neither clinical study nor laboratory aids. He emphasizes the relative value of each and reveals the pitfalls which await him who relies on one method at the expense of the other.

In practical medicine the transition from the older to the newer therapeutic procedures has been gradual and progressive. Serum, vaccine and chemotherapy have superseded many empirical drugs now discarded but formerly a part of the doctor's armamentarium. Empiricism has given us many valuable remedies from the animal, vegetable and mineral kingdoms and even Chinese medicine in employing dried snakes and lizards finds an explanation in the revelations of endocrinology.

With more exact knowledge of disease, we guide nature in her efforts to cure and rely less on polypharmacy. We have little sympathy for the practitioner who has a specific for every symptom and who always accepts personal credit for nature's work. It may be taken as an axiom that many remedies for one ailment mean that none is effective. At the beginning of practice young doctors have twenty remedies for one disease; the old doctor twenty diseases for one remedy. A single remedy spells specific therapy. An intimate friendship with one drug is better than a speaking acquaintance with many.

Our textbooks discuss in a learned way the possible causative factors in diseases of unknown origin, and in so doing cause the student as much confusion as in enumerating a long list of drugs which may be employed in affections for which we have no specific. As soon as the real agent is discovered the long list of possible immediate and remote factors becomes obsolete and meaningless.

The chief and perhaps the only reason for the existence and development of medicine as a profession is the prevention, control and cure of disease. In endeavoring to solve the many complicated problems which are concerned in abnormal bodily states, many collateral sciences are invoked

as aids. The preliminary work required of the prospective medical student is such that he is no longer confronted with subjects entirely new. He has learned something of the basic sciences that comprise his first and second years' work.

The teachers of anatomy, physiology, chemistry, bacteriology and other highly technical subjects, have devoted a lifetime to their mastery. The student is expected to acquire the essentials of these branches in a comparatively short time. The knowledge which is commonplace to the professor is almost a *terra incognita* to the entering student. He is confronted with a new nomenclature and a maze of details which he must master in a given time. When it is realized that a lifetime must be spent to become an expert in one science or in one special branch of our profession, the little that can be taught in the medical course and the yet smaller quantity that can be retained and assimilated is not surprising. The graduate is not a master of the science and the art of medicine. He has only begun to learn.

Each teacher is impressed with the relative importance of his own subject and perhaps exaggerates at times the value of minor technicalities that are only learned to be forgotten. If the main theme or purpose of medical education is kept in mind by the teacher and the student, the facts which have directly to do with the diagnosis and cure of disease will be emphasized by the one and acquired by the other.

A direct correlation of the work in the preliminary subjects with its relationship to the practical branches renders the subjects less abstract, prepares the student for advanced work, and avoids needless repetition. The efforts now being made to correlate and avoid overlapping of the work in the practical departments should include the preliminary and scientific subjects. If the teachers of the latter subjects were more fully informed of the requirements of the third and fourth year faculties, a closer cooperation would no doubt be secured.

A teacher who is the master of his subject can emphasize the essential facts which are of real importance and which can be applied in a practical manner. He can sift and select. The student is not yet sufficiently advanced to do it, and is often bewildered with details of little value. The more thoroughly a subject is grasped by the teacher, the more simply it can be conveyed to the pupil. Complicated and lengthy explanations usually mean superficial or poorly digested information. Lack of real knowledge of many subjects is too frequently concealed by a complicated and foolish nomenclature.

In his zeal to acquire names their real significance and the conditions they stand for are often lost sight of by the student. A book on almost any specialty in medicine expressing in a clear and concise manner our positive knowledge would be a small one. The majority of our textbooks contain too much irrelevant matter, and too much pedantic discussion regarding phases of subjects of which we are in complete ignorance. Our future developments will depend largely on recognizing our present limitations and on continuing to build our superstructure on the solid foundations of accurate knowledge.

Ideals in science and the pursuit of knowledge for its own sake are inspiring phrases, but in a school of medicine for undergraduates more will be accomplished by having in view a definite purpose. The arguments advanced to further cooperation between scientific and the so-called practical subjects apply with equal force to the various divisions of the latter.

It is not the purpose of an undergraduate medical school to make specialists. The student is, however, entitled to the special knowledge acquired by specialists. The viewpoint of the specialist, which is often limited, needs the perspective of medicine as a whole, as well as a fundamental grasp of the general principles of experimental pathology, bacteriology and other scientific branches, so that he may direct research work in his own department and add each year something of permanent value.

The routine work in most of our practical departments is carried on by voluntary assistants, hence frequent changes are inevitable unless something is done to stimulate their interest in research problems. A trained and permanent personnel in any department simplifies the teaching of students, the care of patients and eventually supplies men capable of occupying responsible positions in his own or other institutions.

A well equipped laboratory in each department which could make use of it would further research work by the staff, improve the teaching facilities and keep alive the scientific methods acquired early in the medical course by the student. Problems arise in every department which can only be solved by help from our colleagues.

The medical horizon of each of us would be widened by a more liberal give and take policy, and by more frequent conferences about conditions which touch at the borderlines of the various specialties. In speaking of the mutual obligations of the teaching and student bodies, it must not be taken for granted that all things are given by the former and received without return by the alert and intelligent young women and men who comprise the latter. The mental reactions benefit the one as much as the other. Contact with serious students having the desire to acquire knowledge does much to keep alive the scientific spirit in the teacher. As one grows older this necessity becomes more imperative.

The busy specialist may sacrifice something in teaching, but he is more than repaid by the opportunities to continue in touch with the younger men in his department as well as with the inquiring student he is instructing. These in turn he directs in lines of research and imparts to them his ripper acquirements.

In the strain and stress of modern life, the events of the past are pushed aside and eventually forgotten. We seldom stop to consider the work done by the masters who have preceded us and made our present secure position possible. We accept their gifts but forget even their names. It would be a graceful and well deserved tribute to the epoch making men in his own special work were each instructor to outline at the beginning of his course the important discoveries in his own field and their

influence on our present day knowledge. Were it not for the combined work of the many which leads to our gradual growth the great epochs which mark our progress would not stand out.

Years of work and careful observation are required to gather the necessary facts and prepare the way for some great generalization. The achievements of modern surgery would have been impossible had it not been for the bacteriological discoveries of Pasteur and their practical application by Lister. Every obstetrician and all women owe a debt of gratitude to Oliver Wendell Holmes and Semmelweiss. Our pathological superstructure is built on the solid foundation of Virchow's cellular pathology. Modern scientific medicine has been developed from so many sources that it is difficult to apprise them properly. Many fallacious doctrines were swept aside by Louis and new methods of investigation begun, which influenced in a marked degree the advancement of knowledge abroad as well as in our own country. The great clinician Laennec should always be recalled to the student of exact methods of chest examination.

At this time the currents of medical knowledge and inspiration had their sources in France. At the same time Great Britain was developing her school of great clinicians which included the names of Cheyne, Graves, Stokes, Bright, Addison, Hodgkin, Watson and many others. Austria and Germany in turn because of their scientific achievements and the personality of their great teachers turned the student tide. The depression of defeat, the overthrow of stable governments, and changed economic conditions have for the time retarded scientific development in the countries of Central Europe. We have no desire to profit by the misfortune of our professional colleagues. We do not forget their constructive scientific work and their stimulating teaching. Nothing good can result from keeping alive the war bitterness, but much mutual benefit will follow the restoration of international relations and help extended to the innocent sufferers of the great calamity. America's opportunity is not due to the misfortune of others, but to the impelling force of past and present achievements.

Have we not much to stimulate us in the work of Marion Sims, of McDowell, and in the deeds of our other dead and living pioneers and leaders? Compare the *Medical and Surgical History of the War of the Rebellion* with that of the World War. Read in the former accounts of wound infection, hospital gangrene, tetanus, typhoid fever, and you will see the graphic contrast of medical and surgical conditions then and now.

Can one estimate the millions of lives saved by vaccination against smallpox? Do you grasp the significance of preventive vaccines in typhoid fever and the millions of lives saved in war by this procedure? Is not the conquest of diphtheria by antitoxin a victory no less renowned than one of war? Do not forget that the elimination of yellow fever was made possible by the scientific work of Walter Reed and the personal sacrifices of Lazear and Carroll. Could the Panama Canal have been con-

structed had not Gorgas foreseen and applied the necessary measures of disease prevention?

We shall not dwell upon the slight recognition accorded by our government to the medical heroes who have sacrificed their lives in efforts to find the cause and control of epidemic and contagious diseases, but we may keep their memories fresh in our own hall of fame and convey to our students and the public something of which we and they may well be proud.

What has the present day student of medicine to anticipate? Not all drudgery, let us hope, but four years of interesting and delightful work in which new vistas of science are to reveal their mysteries and charm. Viewed in the right manner and approached in the proper spirit, one can well say, "The work that one delights in physics pain." Each month, each year offers new facts to learn and new problems to solve. Knowledge of the physiology of the wonderful and complicated human machine prepares one to grasp the abnormal functioning. A study of normal psychology affords us an insight into the mechanism of abnormal mental processes. The tissue changes caused by injuries, infections and new growths are made clearer by the study of gross and microscopic anatomy. Each science is a liberal education and a foundation stone in your future building.

A stimulating teacher directs your vision beyond his immediate demonstrations and embellishes his dry facts with concrete illustrations of their relation to your future work. As time goes on a mosaic will finally be completed in which a picture of the body in health and disease stands revealed. Work well done now makes the work to follow simpler and easier. The will to do, the desire to excel, already means the battle is half won. The psychology of achievement reveals latent possibilities of which perhaps you have never dreamed, and urges you to high ambitions.

Leave thy low-vaulted past,
Let each new temple nobler than the last
Shut thee from Heaven with a dome more vast.

8 WEST SEVENTY-SEVENTH STREET.

Coccygeal Neuralgia.—Chartier (*Presse médicale*, April 10, 1920) describes under the appellation "painful syndrome of the filum terminale" a definite form of coccygeal neuralgia characterized by continuous pain at the level of the second and third coccygeal vertebræ. The pain is of the drawing type and extends from the coccyx to the lumbar spine upon forward bending of the trunk, which causes elongation of the filum terminale. Neither pressure nor forcible motion of the coccyx cause pain—a feature differentiating the condition from the true coccygeal disorders. The condition is an expression of pathological change of or pressure upon the filum and the coccygeal nerves it embodies, either in its intradural portion—as in meningitis—or in the sacral canal—as in gouty accumulations, etc. In the treatment, x ray therapy or the high frequency effluve may be used with success according to the type of case.

POLYMORPHISM OF EPIDEMIC ENCEPHALITIS LETHARGICA.*

*Clinical and Pathological Types and Differential Diagnosis.*BY ALFRED GORDON, M. D.,
Philadelphia.

In the early months of 1919 the attention of the medical men in the United States was called to a relatively new disease whose chief anatomical localization was the midbrain. This affection, which is popularly known as sleeping sickness, but which must be distinctly separated from the African disease of the same name, which is due to a trypanosome, is, accurately speaking, not new. As far back as 1712 an outbreak of so-called sleeping sickness occurred in Germany and again in 1890 in Austria, Switzerland and Italy. Von Economo observed it in an epidemic form in 1917 in Vienna. Whether the disease under discussion was recognized formerly or not it is difficult to say. At present, since Netter's observation in France in 1917, the disease is known to exist in epidemic or sporadic form. The epidemicity or sporadicity suggested a microbic origin of the disease. Experiments have been conducted in various countries by inoculating with the nervous tissue from fatal cases (1 and 2), or with filtered extracts of the nasopharynx (3), apparently with positive results. Loewe, Hirshfeld and Strauss believe that they have succeeded in isolating a microorganism which is analogous to that of poliomyelitis but from which it nevertheless differs. All these investigations suggest that the disease probably belongs in the category of communicable diseases, hence the necessity of isolation in suspicious cases and therefore of prophylaxis. In view of this rôle of the nasopharyngeal secretions appropriate measures are indicated.

The clinical picture of lethargic encephalitis presents many varieties. The literature abounds with examples of its polymorphous character. In view of the latter, errors of diagnosis are likely to be made. A presentation of all possible occurrences, with emphasis on the differential diagnosis, may be warranted and this is the chief object of the present contribution. Three principal symptoms, rise in temperature, ocular palsies and somnolence, constitute the general characteristics of the malady. The onset is characteristic of an infectious process; the fever is accompanied by headache, backache, and sometimes vomiting. After the disease has reached the phase of full development it presents the above mentioned triad of symptoms. During this period the polymorphism of the principal manifestations and of additional phenomena sometimes presents diagnostic difficulties.

The ambulatory form.—There are various degrees of somnolence. In mild cases the patient has merely a frequent desire to sleep, although he may attend to his daily occupation. As soon as he sits down he goes to sleep. This is called the ambulatory form. The following brief history illustrates the fact that cases of this character may be overlooked and treated for different affections:

A young married man, who was a cashier in a bank, would frequently, while at work, close his eyes and go to sleep; at the same time he complained of exhaustion. Upon examination I could observe a paretic condition of the external rectus of the left eye. When, during the examination, his brother would engage me in a brief conversation, the patient would fall asleep. This condition lasted four weeks, after which complete recovery took place. This affection was formerly diagnosed as a very probable case of brain tumor for which the physician in charge was contemplating engaging a surgeon for operative procedures. The patient did not, however, present other symptoms of a neoplasm.

In another series of cases the somnolence may be somewhat more pronounced. The patient invariably falls asleep after meals or after the least amount of exercise. His eyelids have always a tendency to droop and he has to struggle against sleep. Although he can be aroused for food, and will answer questions correctly, he nevertheless rapidly resumes his sleep as soon as he has answered.

In some cases the sleep may be still more pronounced. The patient is in a state of absolute inertia, the features are immobile, the cutaneous folds are effaced, feeding by mouth is impossible and one has to have recourse to nutritive enemata. In one case, a girl of eighteen, during the deep sleep, Cheyne-Stokes's respiration was observed, which led her physicians to think of cerebral hemorrhage. The patient nevertheless made a complete recovery. The diagnostic error consisted in overlooking the absence of localizing symptoms, such as abnormal reflexes, etc. In another similar case in addition to the deep sleep, there was marked rigidity of the neck and the attending physician concluded that this was a case of tuberculous meningitis. Here also the patient recovered.

Palsy of ocular muscles is a common symptom in lethargic encephalitis. It is usually an early manifestation. The most frequent symptom is ptosis which is in the majority of cases bilateral. Here we observe various degrees, either complete drooping of the eyelids or merely a heavy feeling. Ptosis, strabismus and diplopia will also be observed. Here again various degrees of these disorders may be present and they may be unequally distributed in both eyes. For example, in three patients under the writer's observation, there was ptosis on one side and external strabismus on the other. The third cranial nerve is more frequently involved than the fourth and sixth. The various muscles supplied by the third nerve are usually unequally involved in the same eye or in both eyes.

The internal muscles of the eyes are less frequently involved. Inequality of the pupils, mydriasis and myosis, paralysis of accommodation, mild nystagmus, are the conditions observed. The intrinsic and extrinsic ocular palsies run an irregular course and their degree is variable.

In addition to the ocular nerves, other cranial nerves may be affected in the following order: facial, hypoglossus, motor branch of the trigeminal, glossopharyngeal and spinal. Facial paralysis, difficulty in swallowing, in masticating, in breathing, in speaking (dysarthria), are then observed.

*To be read before the Philadelphia County Medical Society, December 22, 1920.

In the latter case it may give the impression of pseudobulbar paralysis. Facial palsy may be bilateral. Not only paralysis of the cranial nerves but other paralyzes have been observed. In a case under my care, that of a colored man, there was a mild but distinct right hemiplegia with increased patellar tendon reflex and toe phenomenon. A similar case was reported by Halbron and Coudrain (4). Page (5) also reports a case with monoplegia in the upper extremity.

Sensory disturbances are usually rare. In one case in my series (6) there was a very marked tenderness of the left infraorbital nerve at its exit from the foramen and anesthesia of the left cheek. In Sainton's cases (7) there was a generalized cutaneous hyperesthesia so that the least touch produced pain. In a number of cases other disorders have been observed, such as excessive salivation, involvement of sphincters in grave cases, vasomotor display, gustatory disturbances, but these are all infrequent. Great variability has been observed in the course of the disease; its duration may be from several weeks to many months. The fever, the ocular palsies and the somnolence may present great oscillations in intensity and duration. One may say, however, that when the temperature remains high, the outlook is serious, and when myoclonic phenomena occur, that the prognosis is equally grave. A number of other manifestations of a motor or psychic character are met with at times either in the early course of or during phases of exacerbation of lethargic encephalitis.

The myoclonic type. This is one of the most striking clinical types. The following case is an example: A young man aged twenty-seven, a shoemaker, had a mild attack of lethargic encephalitis. There was somnolence, bilateral ptosis and a slight rise in temperature. The reflexes were increased. The disease ran a mild course and the patient began to improve. During convalescence his family physician observed slight twitchings in the muscles of his shoulder. Soon muscular contractions were seen in the face and in all four extremities. A few days later I found the patient affected with violent twitchings, brief and rapid, at irregular intervals but close to each other and involving every segment of the body. He was unable to eat, to rest, or to sleep. His respiration was rapid and his pulse could not be taken. He expired on the following day. In two cases the myoclonia was accompanied by severe hiccough, evidently due to violent contractions of the diaphragm.

Brouardel, Levaditi and Forestier (8) report a case (verified by autopsy) without ocular disturbances, but with abdominodiaphragmatic myoclonic contractions, which rapidly invaded all the four extremities. Sicard (9) observed five cases in which the initial symptoms were lancinating pain especially in the neck and arms, muscular twitchings in the arms, abdomen and diaphragm. The same author with Kudelski observed also hemimyoclonia confined to one side while on the other the seventh and sixth nerves were involved. It is evidently a mesocephalic condition of the Millard-Gübler variety.

Choreic type. In a girl thirteen years of age, the attack of encephalitis began with choreic move-

ments in the right arm and face. A few days later somnolence made its appearance and soon the involvement of the superior rectus and the external rectus on the left side became evident. Her temperature was 100.2°. The choreic movements lasted through the entire course of the encephalitis. Recovery took place at the end of three months. The lethargy and the muscular movements disappeared totally, the superior rectus recovered but the external rectus is still paretic. The concurrence of acute chorea with a febrile encephalitis supports the view of the infectious nature of the former (10). It is interesting to note a marked hypotonia of the limbs affected with choreic movement. Cases of electric chorea (Dubini) have been reported in conjunction with lethargic encephalitis.

Hemiplegic form. Cases with one sided paralysis are not frequently encountered. In addition to my case and Halbron and Coudrain's case, no record could be found in the literature. In my case the paralysis was mild. At the time of writing these notes the patient shows evidence of considerable improvement of all symptoms. The paralysis may be confined to one limb (monoplegia). Such a case was observed by Page (5).

Convulsive type. One such case came under my observation. It occurred in a middle aged man whose Wassermann test was positive, but who formerly was free from epilepsy. On the third day convulsions of a generalized character occurred. During the entire illness which lasted three months the patient had three attacks. Recovery was complete. He was treated with antiluetic remedies. In some cases the epileptiform convulsions were of Jacksonian type. In such cases a paretic condition or contractures on the same side have been observed. The prognosis in such instances is very grave (11). Aubry and Froment report two cases of trismus. One occurred in a pregnant woman who presented in addition to the characteristic symptoms, dysarthria, difficulty of swallowing, and trismus. The patient died. In the other case there were myoclonus and trismus. Trismus was probably due to an irritation of the motor nucleus of the fifth nerve.

Meningeal type. The triad of encephalitis lethargica symptoms developed in a girl, sixteen years of age. Her temperature rose to 102.4°. At that time her neck was rigid and Kernig's sign was present, facts which led the attending physician to reject the diagnosis of encephalitis. Within a week the two meningeal signs subsided and rapidly disappeared. The oculomotor palsies and somnolence remained. The patient died at the end of nine weeks after a period of Cheyne-Stokes respiration and difficulty in swallowing.

In this case the meningeal phenomena somewhat obscured the encephalitic manifestations. Nevertheless the disease began with the characteristic symptoms. It is to be borne in mind, therefore, that the same infectious agent which affects the nervous tissue of the mesencephalon or other portions of the brain tissue, may simultaneously involve the meninges and thus present a complex clinical picture. Rathery and Bonnard (12) report the case of a young girl in whom, in addition to ocular palsy, fever and somnolence, there were also Kernig's

sign and rigidity of the neck. The spinal fluid was under great pressure and distinctly hemorrhagic, containing 5.40 gr. glucose, with marked leucocytosis (50,000). Bassoe (13) also reports cases of meningeal type.

Sometimes encephalitis lethargica may present a condition suggesting strongly a basilar meningitis. In a young lady aged twenty-four years the disease began with vertigo and headache. The temperature rose to 101°. On the following day the patient noticed that she had great difficulty in keeping her eyes open. She was drowsy, could not keep up a conversation. Her neck was somewhat rigid. Kernig's sign was absent. There was a mild crossed paralysis. The facial nerve on the left was involved and right leg presented an increased knee jerk with ankle clonus and toe phenomenon. There was paresis of the left external rectus and also bilateral ptosis. The patient came of a tuberculous family and she was treated for suspected pulmonary tuberculosis. For three months her condition remained stationary with the exception of the temperature which fluctuated from 99.2° to 100°. Her lethargy became more and more pronounced. Finally she began to improve, the crossed paresis disappeared, the left external rectus became normal, the ptosis improved greatly. There was no more rigidity of the neck. For weeks thereafter, however, she felt drowsy. Eventually she recovered completely. A basilar tuberculous meningitis suggested itself very strongly, but the entire course of the illness, together with the spinal fluid findings, proved the case to be one of encephalitis.

Parkinsonian type. In two male patients, both of middle age, there was a typical picture of encephalitis. On the third week after the onset, passive tremor in the right hand with facies characteristic of paralysis agitans developed. On recovery from the encephalitis the tremor disappeared but for a long time the general attitude, the rigid and fixed position of the trunk and the mask like expression of the face remained typical. In a third case the tremor was absent but the facial expression was that observed in Parkinson's disease. After recovery from the original disease, the evidences of shaking palsy disappeared. Marie and Lévy (14) in describing their autopsied cases call attention to the lesions of the locus niger observed in paralysis agitans by some writers and to the predominance of encephalitis lesions in the mesencephalon. In a recent case of Trétiakoff and Bremer (15) paralysis agitans developed in the course of encephalitis lethargica. At autopsy a pronounced degeneration of locus niger was found in addition to other nuclear lesions.

Bulbar type. Four cases came under observation. In two of them (6) there was difficulty in swallowing and dysarthria because of a paretic condition of the lips and tongue. In the second case there was also unilateral facial paralysis and in the third involvement of the fifth nerve on one side. Both of these patients recovered. In two unpublished cases the initial symptoms were bulbar. One patient had difficulty in swallowing for several days, with temperature rise to 100°. On the fourth day the patient became somnolent, complained of

vertigo while in bed and, at the same time, bilateral ptosis and external strabismus on the right made their appearance. It is interesting to note that when improvement eventually set in, it was evident first in the symptom which developed first, viz., in the act of swallowing. The affection of the eye muscle persisted the longest. In the second case a difficulty in speaking was noticed in the course of the encephalitis, when the patient was aroused for food. He was unable to move his tongue and lips properly in speaking as well as in masticating, but there was no difficulty in swallowing. It was observed that this disorder appeared on the day when there was a rise of temperature (102°) as if an infectious element had penetrated the nucleus of the hypoglossal nerve. This particular disorder lasted a long time after the lethargy had disappeared. The patient made a complete recovery.

Neuralgic and neuritic types. Cases have been reported in which pain appeared in the face and in the extremities or was of a generalized character. In case number one of the first contribution (6) the encephalitis began with generalized pain which persisted as long as the temperature remained at 100° but subsided when the latter remained below that figure. In this case the pain was unusually severe and continuous in the neck more on one side than on the other. In Salmont's case (16) the patient, during four consecutive days, had violent pain in one arm. The radial reflex on the same side was altered, revealing the presence of a cervicobrachial radiculitis. On the fifth day lethargic encephalitis developed from which the patient subsequently died. Sicard (17) reports a case in which at the onset there was pronounced intercostal pain persisting during ten days and followed on the eleventh day by contractions of the diaphragm and somnolence and terminating in death. Similar cases were reported by Bassoe (13).

Mental type. In the apparently uncomplicated forms of encephalitis lethargica while there are no mental phenomena of a special character, nevertheless the sleep is not that of normal men. It is true that when the patient is aroused, he opens his eyes, answers questions more or less correctly and returns to his sleep, but back of the lethargy the psychic state is always more or less benumbed and functions defectively, i. e., the patient's orientation or appreciation of the condition is defective, he frequently makes mistakes, there is a certain sluggishness in associating ideas. Sometimes we observe what the French call *état crépusculaire*. This is analogous to the mental state observed in exhausted or inebriate individuals, the patient shows a very mild confusional appearance; his facial expression and his entire attitude exhibits surprise and astonishment when he is being observed or addressed.

In some cases, however, there is a genuine confusional state with delirium. With eyes closed the patient mutters unintelligible words and when he is awakened will look around as if bewildered and may not recognize surroundings. In another group of cases a genuine psychosis may make its appearance in the course of encephalitis lethargica and continue as such after the latter has recovered.

An interesting case of this type came under my

observation. A young man, aged twenty-three, had a mild attack of the disease from which he recovered completely. During the illness, when aroused for food he was disorientated in time and space, and had a tendency to get out of bed. This latter effort would last about five minutes, after which he would become somnolent again. Upon recovery from the somnolence and when eye conditions and fever had subsided, his mental state remained unimproved, even became more and more accentuated. When he was able to be about, he showed a hypomaniacal state, restlessness, talkativeness, voracious appetite, excessive desire for smoking, also puerilism. He talked like a child, laughed at the most insignificant remarks, acted in a silly manner, preferred to play with children. All the physical symptoms of the encephalitis had disappeared, but the mental condition was persisting five months after onset of the illness. The patient's personal previous history was negative, but the family history recorded mental disorders in several of its members.

In another case, that of a man thirty-nine years of age, there was marked depression at first. The hopelessness and despair expressed by the patient gradually led his physician to view possible melancholia, especially when the patient began to speak of suicide. Upon examination made ten days later, the writer noticed left sided ptosis, right sided internal strabismus and actual somnolence. The latter developed after the phase of depression. The patient was ill for nine weeks. As soon as the lethargy began to disappear, the former depressive state reasserted itself. Fifteen months after the recovery from encephalitis the patient was still in a state of depression with suicidal tendencies. Froment and Comte (18) report a case which started with epileptic seizures of Jacksonian type and delirium with visual hallucinations. Cortical involvement is here evident.

Cerebellar type. A man, aged thirty, after having recovered from somnolence in encephalitis showed the following symptoms in addition to oculomotor disturbances: ataxic gait with tendency to fall to the right, right hemiasynergia, adiachokinesia on the right, pastpointing on the right, and diminished patellar tendon reflex on the right. Eventually the man made a complete recovery. The examination of the patient's labyrinth was negative. A similar observation is reported by Achard and Leblanc (19).

Poliomyelitic type.—Tilney (20) reports the case of a child of four in whom prolonged somnolence was associated with acute anterior poliomyelitis. Such combinations are rare, nevertheless they show the possibility of simultaneous involvement of the spinal cord and brain.

Sensorial type.—Amaurosis and deafness have been observed in some cases as conspicuous symptoms. In Vincent's two cases and in Carnot's case day could not be distinguished from night. In the former's cases there were achromatopsia and deafness; in the latter case the amaurosis subsided a long time after the somnolence and at the same time the syndrome of bulbar palsy made its appearance (21).

Paraplegic type.—Sicard (22) gives the history of a woman who at first had an attack of flaccid paraplegia accompanied by retention of urine and

lethargy. During convalescence muscular twitching and rhythmic tremor in the upper extremities developed. I believe that there was simultaneous involvement of the mesencephalon and of the spinal cord with its roots in the lumbar region.

Incomplete forms.—In a certain number of cases the triad of symptoms has not been complete. Thus cases have been reported without ophthalmoplegia or without lethargy, or else with very slight somnolence, and finally in some cases there was little or no rise in temperature. Abortive forms have also been reported. In a case under the writer's observation the patient had a slight rise in temperature, general malaise, diplopia in looking toward the right; he felt drowsy and frequently would close his eyes. The entire condition lasted six days. Recovery was complete.

DIFFERENTIAL DIAGNOSIS.

In making a diagnosis of encephalitis lethargica one should bear in mind the three fundamental symptoms, ocular palsies, somnolence, and rise in temperature. It may be of interest to add a few data concerning the humors. The cerebrospinal fluid is usually clear, without undue pressure and without lymphocytosis, and these negative findings are uniform in all stages of the disease. Some observers, however, speak of a lymphocytosis in the early stages which gradually diminishes and disappears. This fact is important, for in meningitis the reverse is true (23). In a certain number of cases the spinal fluid contained an increased amount of sugar (24). In Netter's last six cases there were seventy, eighty-five, eighty-five, ninety-five, eighty-three and ninety-seven centigrams to the litre. According to Benard (25), a glucose content of 0.67 to 1.06 gram is a material aid in the diagnosis. It is possible that the richness in sugar is due to the irritative process in the medulla in which the centre discovered by Claude Bernard is situated. In meningitis, on the contrary, glucose is diminished. The blood, as a rule, presents no appreciable change in numerical count. However, in some cases a moderate leucocytosis was observed (26).

In view of the large number of associated symptoms and the multiplicity of varieties, the diagnosis of lethargic encephalitis is sometimes surrounded with difficulties. The protean character of the disease must be borne in mind, as grave errors of diagnosis have been reported and very serious maladies have been overlooked.

One of the diseases with which the affection under discussion may be confounded is meningitis. The above mentioned progressive increase of lymphocytes as the disease advances and the decreased amount of glucose in the spinal fluid are evidences of meningitis. In the tuberculous form of the latter somnolence is usually present but the abundant lymphocytosis and tubercle bacillus in the spinal fluid, the dissociation of temperature and pulse, also the irregularity of the latter, are all absent in lethargic encephalitis. In cases of doubt as to the possibility of syphilitic meningitis, Wassermann reaction, and treatment with antiluetic remedies will ascertain the nature of the condition. Meningitis of other forms will be recognized by rigidity of the neck, by the presence of Brudzinski's and

Kernig's signs, retraction of the abdomen, dissociation of pulse and temperature, and finally by the state of the spinal fluid (see above). Of course the observations recorded above demonstrate the fact that the meningeal manifestations should not be taken as absolutely final. Epidemic cerebrospinal meningitis is characterized by a cloudy spinal fluid, marked leucocytosis and meningococci.

The English writers considered the first cases observed in England as instances of botulism in view of the pronounced asthenia and paralysis of accommodation, but in this disease there is usually a dryness of the throat and mouth, with thirst, obstinate constipation, and extreme dilatation of the pupil, all symptoms which are wanting in encephalitis. Besides, fever is absent in botulism and there is not a true somnolence but a rapid coma.

Lethargic encephalitis may be confounded with hemorrhagic superior poliomyelitis, but the latter runs its course without rise in temperature and is accompanied by marked nervous manifestations in the motor and sensory spheres, such as ataxia, unilateral paralysis of the extremities, exaggeration or abolition of tendon reflexes, disturbances of speech, deglutition, and mastication. Finally, there are grave ocular lesions (optic neuritis, nystagmus, associated paralysis). Tumor of the brain may simulate an encephalitis, in view of the motor disturbances and the drowsiness, but severe headache, vomiting, optic neuritis, or atrophy, or papilledema, are encountered only in cerebral neoplasms.

Cerebral abscess may also simulate lethargic encephalitis because of the somnolence, but the eye ground changes, the condition of the blood, slowness of the pulse will enable one to recognize the former. Anterior poliomyelitis in its bulbar and pontine varieties may sometimes give the impression of encephalitis, but the predilection for early childhood, its occurrence chiefly in warm seasons, absence of meningeal reactions, paralysis, and atrophy of the affected extremities due to serious alterations of the cellular elements, are all characteristic of the former. Encephalitis attacks adults preferably, produces but slight cellular lesions, and is usually of a more favorable prognosis.

Intoxications may be accompanied by a state of stupor simulating lethargy. The mental state following the administration of opium and chloral is analogous to, if not identical with that in encephalitis. Uremia and diabetes may present the same picture.

Narcolepsy is a functional nervous disorder which may be confounded with the somnolence of encephalitis. It is to be borne in mind that narcolepsy is a manifestation of hysteria and may be removed by suggestion, psychotherapy, or psychoanalysis. Besides, it is totally free from organic symptoms characteristic of encephalitis.

Comatose states are differentiated from encephalitic lethargy by total loss of reaction to sensory stimulation, while the essential characteristic of somnolence in encephalitis consists of responsive reactions to stimulation; the patient can be aroused for partaking of food, and to answer questions asked. Besides, profound coma is associated frequently with conspicuous motor disorders due to profound

cerebral lesions. Neither do we find the ocular disorders characteristic of encephalitis.

Stupor due to cerebral syphilis may present great obstacles in formulating a diagnosis. In both conditions we find somnolence and palsies of ocular muscles. In such cases we must recall the character of the somnolence of encephalitis. In syphilis the stupor is continuous and if the patient is aroused the mental hebetude is pronounced, the patient is unable to understand fully what is spoken to him. In encephalitis the patient answers questions correctly and takes his food properly; in other words, there is comparative mental lucidity. Finally, the state of the cerebrospinal fluid with its lymphocytosis and positive Wassermann reaction will decide in favor of cerebral syphilis.

The modifications in the clinical picture of the disease, thus presenting special forms, correspond to the many variations in the pathological findings. The clinical polymorphism finds its explanation in the anatomical polymorphism. Let us now consider the varieties of lesions.

Grossly speaking, the pathology of lethargic encephalitis consists of inflammatory degenerative processes chiefly in the midbrain. Despite the variability and irregularity of localization, the lesion predominates in the cerebral peduncles. According to Marie and Trétiakoff the locus niger is most frequently involved (27). As to the lesions, there is essentially a perivascular inflammation with all its characteristics: dilatation of the blood vessels with cellular infiltration, occasional rupture of the vascular wall, and hemorrhagic inundation of the adventitia and the neighboring tissue. Transudation with localized edema, especially in the cortex, is sometimes seen. The cellular infiltration is not confined to the vascular wall and very frequently invades the gray matter. In addition to the inflammatory process there is also a secondary destruction of nerve cells and fibres. The cells present all degrees of chromatolysis. Neuroglia cells participate in the pathological process. The localization of all these lesions presents all degrees of chromatolysis. Neuroglia cells participate in the pathological process.

The maximum of involvement is found in the gray matter of the aqueduct of Sylvius and the fourth ventricle. The lesion radiates toward the gray substance of the pons and medulla. On the other hand, it may reach upward to the basal ganglia, viz., the optic thalamus and striate bodies. The nuclei of the fifth, sixth, and seventh nerves are sometimes involved, and Marinesco observed atrophy of the dorsal nucleus in the pneumogastric nerve. In the cases cited above the ninth, tenth and twelfth nerves were also involved. In Marie's and Trétiakoff's cases (27) not only the above mentioned structures were involved, but also the red nucleus, interpeduncular space, the tegmentum, the locus niger, the floor of the fourth ventricle, nuclei of the pons, the first two cervical segments, cerebral and cerebellar cortex, finally the meninges and ependyma of the ventricles.

We, therefore, see that the pathological condition is vast and concerns particularly the entire central nervous system. Of course, as such it is not met

with in all the cases, but the distribution of the lesions presents great irregularities. In pronounced or generalized cases, the entire cerebrospinal axis may become involved. In less pronounced cases the lesions are distributed in the pons and medulla, in mild cases only in the locus niger and its vicinity. There is also a large number of intermediary cases. The polymorphous character of the anatomical findings is, therefore, in keeping with the polymorphism in the clinical picture. The distribution of the lesions has a considerable bearing not only on the diagnosis but also on the prognosis. The knowledge of the state of reflexes is important from this viewpoint. It seems that abolition of the tendon reflexes (which is observed in some cases) with preservation of the cutaneous reflexes shows that the disease is not always confined to the bulbo-pontinepeduncular region, but it has a tendency to become diffuse eventually. Guillain makes an interesting prognostic observation in four cases: precocious abolition of tendon reflexes has a bad outlook, as all the patients died. In two cases in which the reflexes remained normal, the patients recovered.

Lethargic encephalitis is a protean disease with its histological characteristics of a definite type but with a great variety of localizations throughout the entire central nervous system. The infectious character which has been determined presents a promising field in the domain of treatment and therefore of prophylaxis. In view of continuously accumulating data the final word is approaching.

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1812 SPRUCE STREET.

CUTANEOUS ANTHRAX.*

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This paper will deal particularly with the manifestations of anthrax as I have observed them in the course of my work during the last few years, and let me say at the outset that my remarks will be confined to a discussion of that type of the disease known as cutaneous anthrax, or malignant pustule, for I have never seen a case of the internal variety, variously known as intestinal mycosis, woolsorters' disease, and splenic fever. Anthrax is of rare occurrence in this vicinity and heretofore the mortality has been very high, especially in cases involving the face or neck; but in spite of a decided increase in the number of reported cases during the last three or four years, methods of treatment adopted and perfected within this period have apparently resulted in a notable reduction in the percentage of deaths. It has been my unusual good fortune to inspect at some time during the duration of the attack, almost all the cases reported to the Health Department from the Borough of Manhattan since January, 1915; also occasional cases prior to that date. It seems probable that neglect to report cases, whether deliberate or as the result of failure to recognize the condition, is rare. And even though, now and then, one victim may die with the disease incorrectly diagnosed, and another may recover without his physician going through the formality of notifying the authorities, I believe that the total of cases on file at the department approximates very closely the actual number of infections that have been incurred here in the period mentioned.

I do not desire to burden you with figures, and my only offense of this character will be to quote statistics showing, 1, the incidence of known cases in the whole city and in Manhattan since January 1, 1915, and, 2, the recoveries and deaths from the disease during the same period.

	Whole City	Manhattan	Recoveries	Deaths
1915.....	9	4	0	9
1916.....	4	2	1	3
1917.....	17	8	8	9
1918.....	15	10	11	4
1919.....	17	10	8	9
1920.....	20	13	18	2

(To Nov. 1.)

My acquaintance with anthrax began in the autumn of 1911. A patient, who was a delivery wagon driver by occupation, and who, incidentally, took partial care of his horse, came to see me, looking ill and thoroughly exhausted. In reply to a question as to what ailed him, he said he had a "pimple" on his arm, which, by the way, is the usual description of the affection offered by the patient. The mental picture afforded by the subsequent examination is still most vivid. On the ulnar side of the left forearm, just above the wrist, was a black scab, the size of a dime, depressed, craterlike, in a brawny looking inflamed mass about four inches

*Read before the Riverside Practitioners' Society of New York, November 23, 1920.

in diameter. This eschar was bordered by a pustular rim and just outside its edge were numerous little vesicles dotting the red surface. From the finger tips to the shoulder there extended a huge edema, the limb appearing twice its normal size, and had it not been for the angry look of the centre of infection the whole affair would have resembled a dropsical edema. The man said that the first indication that there was anything wrong had appeared about three days before in the shape of a troublesome burning sensation on his wrist; that, although he noticed a pimple had formed and was steadily enlarging, it had not bothered him specially; in fact, in decided contrast to its very ominous look, it was not hurting him then. A head had developed, however, and he had pricked it, thinking it a small boil. Following this operation, the process had spread with such rapidity that he thought it ought to be treated. Suffice it to say that after a long and serious illness, this man got back to work, though with his health permanently impaired by a bad heart, a condition which developed during his attack.

I confess with some hesitation that I failed for some time to recognize the true nature of this infection, and you may rest assured that these details have not been recounted for the purpose of glorying in my ignorance. But in thinking over my experience in this particular case and in studying other attacks of a similar character, two things have impressed me and have influenced me very much in preparing this paper. First, that the lack of familiarity with the appearance of this lesion, due to its rarity, has probably resulted in others also having diagnostic difficulties, such as I have confessed, and second, that inasmuch as the infection is almost invariably far advanced when the patient first appears for treatment, it is, generally speaking, essential to a successful result that we identify the lesion promptly when we see it, and that with equal promptness we institute proper treatment. This last point is put forward with the proviso, of course, that we accept the fact that treatment is efficacious.

It will not be amiss to say that very few doctors ever see a case of this disease. An incident which in a way bears out the correctness of this assertion occurred in an Army camp in 1918. Two soldiers, of whom I shall have more to say later, were sent to the Base Hospital infected with anthrax, and of the threescore or more medical officers stationed there at the time, it appeared that but two had had

any previous experience with the malady; and this is probably a considerably higher proportion than would be found to exist among the profession as a whole. On the other hand, this lesion is so unique in appearance that, once it is identified, I believe it will remain fixed in the mind's eye for all time.

ETIOLOGY AND MODE OF TRANSMISSION.

The *Bacillus anthracis* is the causative organism. It uses as its portal of entry to the body any conveniently placed abrasion of the skin. Upon its entry, there promptly ensues the formidable inflammatory disturbance originating at and spreading from the point of inoculation, and, what is more serious, if the infection is not energetically attacked, there will develop later an overwhelming bacteremia. I am told that it is comparatively easy to find the bacillus in smears and to grow it in cultures taken from the pustule; positive blood cultures are, however, obtained only in cases approaching a fatal termination. The bacillus is not a pus producer and is itself easily killed, but its spores are very resistant to heat and germicidal agents. I should say possibly in this connection that the fatal attacks are generally those in which the face or neck is the site of the lesion, for there the tissue is loose and elastic and the blood supply plentiful. In each of the attacks which I have personally seen, where an extremity was the part involved, the patient has recovered.

The disease is most often found in those engaged in the handling of horses, sheep, and cattle, in fact, of all herbivorous animals; also, in those employed in the handling of the hair and hides of such animals. In late years, it has become a well recognized and established fact that shaving brushes, especially of the cheaper sort, may and frequently do carry the infection. The resistance of the spores to measures of sterilization already mentioned makes it very difficult to free hides and bristles from infection without at the same time ruining their texture; and this fact readily accounts for the brushes acting as carriers of the disease. An interesting etiological point is that while anthrax is quickly and easily transmitted under certain conditions from an infected animal or its hair or hide to a human being, there is very trifling danger, judging from our experience here, of this type of the disease passing from man to man. At best, human susceptibility to this infection appears very slight.

SYMPTOMATOLOGY.

The incubation period is short, probably less than three days. The primary lesion is practically always single and appears on an exposed portion of the body—the face, neck, wrists and hands—with the neighborhood of the angle of the jaw the most favored point of attack. Perhaps to be quite accurate, it should be said that on rare occasions there may be double lesions, though always in the same locality, and just as rarely the so-called pustule is located elsewhere than on the parts named. The patient will state that the first evidence of infection was a slight but persistent itching or burning sensation at the point of inoculation, which is probably an abrasion resulting from a scratch, a razor cut, or other minor injury. Very quickly there forms on this spot a tiny papule, no larger often than a mosquito



FIG. 1.—Striking drawing made at bedside of patient in Bellevue Hospital by Dr. Windom Blanton, of Richmond, Va.

bite or an acne lesion and causing just about as much discomfort as one would experience from such an affection. Little attention is paid to it, though in a few hours a chill or at least a chilly sensation may occur. Some time after this chill, the papule develops a head, the contents of which may be either hemorrhagic or vesicular in character. This head will shortly break down of itself, be opened by the patient, or be cut in the process of shaving. On its destruction, there regularly forms in its place a black necrotic eschar. From the time of its appearance, this eschar is a very intimate, prominent, and ever present part of the lesion and it adds to the clinical picture a diagnostic point of such importance, that we may well pause long enough to set forth the following facts regarding it:

1. It is purplish black in color.
2. It appears to be set into or framed in the papule.
3. Its size may vary from a coffee bean to a silver dollar.
4. Its border may be smooth and clean cut, or serrated.
5. Its contour may be round, oval or irregular.
6. It may have a pustular rim, which is not infrequently a delicate gray line, apparently inlaid between the scab and the deep red tissue outside its border.

I return to the consideration of the papule with the remark that, while in its early state it is certainly insignificant and harmless enough in its general appearance, this is no longer true after the formation of the pustule and its successor, the eschar. From that time it enlarges very rapidly until it becomes an irregular, though fairly circumscribed mass. This is sometimes tumor like and may attain the size of a hen's egg, but more often it is flat, much resembling a carbuncle in this respect, with its elevation above the surface scarcely appreciable owing to the adjacent edema. This mass is dark red in color, firm to touch, indurated and brawny; altogether a thoroughly vicious looking affair. When incised it offers almost as much resistance to the knife as would fibrous tissue and it may turn the point of a large hypodermic needle with ease. When the disease has existed three or four days, at which belated time the patient usually seeks the advice of a physician, the lesion will have lost most or all of its individuality, by having merged itself into the edematous tissue around it, and it then presents to the eye the appearance of a more or less diffuse cellulitis. The eschar sticks through thick and thin, and will be found embedded in this mass. With the continued advance of the disease, the induration becomes more widespread and the redness creeps further out until it finally covers the whole of the edematous area.

I believe that the most striking thing about anthrax is the edema. It starts early, very soon after the papule begins to assume form; it spreads rapidly and its extent is apparently unlimited, although it must depend to some degree on the laxity of the tissue in the region involved. The initial lesion is not always, in fact, I think not often, in the centre of the edematous area, and the edema may be noted spreading out from it somewhat in the same manner that erysipelas spreads from the point of inoculation. Perhaps I can emphasize how impressive this edema often is, by describing a case seen this year.

A truckman for a firm dealing in hides presented himself at one of the hospitals for treatment. He was a sorry looking spectacle. (Fig. 1.) The left side of his face was so swollen and distorted that he hardly looked human; the left eye was closed by great edematous eyelids; the right cheek and eyelids were also tremendously puffed up; the lines of his neck on the left side were almost obliterated and an enormous edematous collar ran most of the way around his neck, and made evident pressure on the trachea. The edema involved besides to some extent the soft tissue in the pharynx and larynx, though strangely enough in this case it hardly lapped over at all on the chest wall, as so often happens where there is a cervical lesion. Though he had been ill but three days, all semblance of the papule had disappeared. In its place, there was a good sized, angry looking area of inflammation below and behind the left ear, with the smallest eschar I have ever seen embedded at the point of inoculation. There were no difficulties of diagnosis offered by this patient, but in addition to illustrating the widespread area which can be covered by the edema, it showed too the rather startling rapidity with which the affection can develop. You may be interested



FIG. 2.—Case I. (Published by courtesy of Dr. Douglas Symmers, Director of Laboratories of Bellevue and Allied Hospitals.)

to hear that in spite of the critical condition and horrible appearance of this patient, he recovered in due time.

To complete the description of the cutaneous lesion, it remains only to mention the fact that an

indefinite number of vesicles, arranged singly or in groups, are generally, but not necessarily, scattered over the inflamed surface of the mass just outside the edge of the scab. They have no connection with the actual border of the eschar, which you will remember can be pustular in its makeup.

The lymphatic glands near the lesion are enlarged. There is a leucocytosis, sometimes marked. I have read of cases in which the count was 30,000 white cells. Anders and Boston in *Medical Diagnosis* give the average leucocytes in thirteen cases as 13,900. There is no special combination of constitutional symptoms which can be considered as regularly associated with anthrax, nor do such general symptoms as are found bear any direct relation to the virulence of the attack. The temperature may be moderate even in severe cases; or it may reach 106° or higher. The pulse is usually rapid, but I have seen wicked attacks in which the rate was slow. The patients may have a pasty pallor, but they rarely betray by their appearance the severe character of the infection which has gripped them. There is one characteristic feature which will generally be found, namely, marked physical weakness on exertion in surprising contrast to the appearance when at rest. The patients also exhibit mental apathy as a rule, are easily wearied by questioning and often act as if dazed, though even in fatal cases they retain consciousness to the end. A point which I think is significant and about which I invariably inquire, is the unanimity with which these patients declare they have little or no pain and I have no doubt that this feature of the disease accounts to a large extent for the long time which usually elapses before they come for treatment.

DIAGNOSIS.

With laboratory facilities available, the diagnosis can generally be confirmed in a short time, though once in a while the bacillus is not found. I believe that in view of the rather easily recognized earmarks shown by anthrax, one is justified in most cases in basing his opinion purely on clinical evidence. To wait for bacteriological proof is a doubtful expedient and may have serious consequences for the patient. By way of illustrating the futility of depending too much on the microscope, I am led to refer again and more in detail to the case of the two soldiers mentioned in passing a while ago. These boys were admitted to the hospital a few days apart and although from the same organization, indeed from the same tent, they were unacquainted with each other, the second man having been mustered into the service after the removal of the first man to the base. Both exhibited a typical papule at the angle of the jaw, and though in different stages of development, the lesion in each case was surrounded by considerable edema. They complained of practically the entire list of symptoms enumerated as characterizing anthrax. Furthermore, the first patient stated that he had purchased a cheap shaving brush in a railroad station on his way down to camp and that he had used it but twice when he began noticing symptoms. We could never actually verify it, but there was ground for rather more than a strong suspicion that the second patient had found this brush and had appropriated it for his own use.

The point which I wish to emphasize in this incident is that, notwithstanding the history and in spite of the thoroughly typical picture presented by these patients, the organism was not found in the smear or culture taken from the lesion in either case, and so they are not mentioned in the War Department records. But in the minds of the two physicians at hand who were familiar with the disease, the diagnosis was clear beyond the shadow of a doubt, and the fact that energetic measures of treatment were applied at once, despite negative findings, was I believe in a large way responsible for complete recovery in both cases.

Bearing in mind then that, if I am right in the opinion just expressed, the diagnosis of anthrax based on clinical evidence alone is not only feasible, but as a rule comparatively simple, let us review the salient points in the rapidly developed picture, which may have to be considered in arriving at our conclusion. It is essential as a preliminary step to ascertain if the patient was employed in caring for cattle or in the handling of their hides or hair; or if perchance he had recently used for the first time a new shaving brush. By a combination of questions and personal observation, we will learn that the first evidence of disease was a burning or itching sensation at the point of inoculation; that on and around this point there developed in rapid succession a small, insignificant papule, then a much larger papule, then a mass of intensely inflamed tissue, fairly circumscribed, sometimes tumor like in form but more often flat, resembling in a general way a carbuncle, and finally a diffuse, indurated cellulitis like area of inflammation, which merged itself into the encircling edema without showing any distinct line of demarcation. It is significant too that with all this objective display, we will probably be told that pain is negligible. We will learn further that quite early the papule developed a hemorrhagic or vesicular head; that this quickly ruptured and that its place was taken by the telltale black eschar. Just outside the border of the black crust, we will observe in most cases a number of vesicles scattered over the inflamed surface, singly or in groups. Finally we will note the edema, which in all likelihood will literally fill the eye, and we will be told that it began early and that it attained its present extensive proportions by steady and quick progress.

Having touched on these important diagnostic points, let me say that the early stage of the disease is likely to interest us only from the viewpoint of building up our history, for it is seldom that we see the patient until the disease has existed at least three or four days. At this period of the attack, I think we can regularly expect to find, 1, a large area of inflammation, perhaps circumscribed, perhaps diffuse, surrounding the point of inoculation; 2, a black eschar superimposed on that point; and 3, an edema which will probably be farreaching and entirely out of proportion to the cutaneous disturbance around the focus of infection. When we find this trio of signs associated, we can be certain that we are dealing with anthrax. Constitutional symptoms have not been dwelt upon here for they aid us not at all in making a decision.

The disease can be differentiated clinically from

carbuncle by the lack of an eschar, the absence of extensive edema, the less marked constitutional symptoms, and the presence of cribriform openings in the latter affection. To mistake it for a syphilitic chancre appears far fetched.

TREATMENT.

I shall mention briefly the various methods of treatment which have been used in the years covering my familiarity with the disease. I wish it to be remembered that practically all that is said in this paper is based on personal observation of this affection as it has occurred in New York city, and while an earnest effort has been put forth to portray accurately the results of this study, no claim is made that every case of anthrax must needs accord with the picture drawn here in all its details. In fact, in reading papers and reports by men who know the subject in other localities, one is impressed with the very material difference which often exists between figures given by them as to the incidence, results of treatment, and mortality of the disease, and similar data on record here. It is fair to say, too, that not a few good men scoff at the idea that the treatment of anthrax is of any avail, and, be it said, we now and then see a patient act in such a way as to make us think their opinion may be correct. However, after following up a considerable number of cases and after talking the matter over with physicians skilled in the handling of the disease, I for my part feel that it is hard to deny that treatment is efficacious in the face of the increasingly satisfactory results which follow the method now in vogue here.

Up until very recent years, there appeared to be no uniform opinion as to the proper method of attacking the lesion. It was cauterized, excised, incised, poulticed with various supposedly curative applications, or left alone, and truth to tell, one mode of procedure seemed about as potent as another and the mortality was rather appalling. Some time in 1916, I first heard of the use in the treatment of human anthrax of the serum prepared by the U. S. Agricultural Department and known as Eichhorn's serum. The method then followed was to combine as wide an excision of the lesion as was practicable, with the intramuscular or intravenous injection of the serum at certain intervals. This was undoubtedly a step forward and was signalized by an improvement in the mortality records. However, there was certainly a question about the propriety of making an extensive fresh incision in this dangerously infected area, and the method was inadequate, too, in that it offered no relief in those cases, frequently seen, where the inflammatory infiltration of the tissues was so widespread as to make an operation out of the question.

About two years ago, Dr. Joseph C. Regan of the Kingston Avenue Hospital, Brooklyn, evolved a scheme of treatment which meets effectively the difficulty in such cases, but which is applicable also to any surface anthrax lesion. He discards entirely the cutting and destructive operations, and introduces the antianthrax serum directly into the body of the lesion itself by means of several small injections around the periphery of the eschar. He uses seven to ten c. c. locally once daily and at the

same time administers twenty to forty c. c. intramuscularly, or intravenously, if the bacillus is found in the blood. At Bellevue Hospital, where this idea has been put into effect in a routine way, they have not been so conservative, for there they have used the serum intravenously in all cases, and have repeated the doses locally and in the vein every four hours for several days at a stretch, without, so far as my knowledge goes, any serious or even especially unpleasant consequences. The results, though, have been no better than at Kingston Avenue.

Let me say, in conclusion, that practically all the cases this year have been treated by this method; furthermore, they have been as serious as any I have ever seen. Then let me ask you to call to mind the figures on recoveries and deaths for the year, quoted at the beginning of this paper, and to compare them with the figures for the preceding years. When you have done this, I believe you will agree that if we have not attained actual perfection in treatment, we are at least making progress toward a happy solution of this serious problem.

202 WEST EIGHTY-SIXTH STREET.

X RAY TREATMENT OF EPITHELIOMA WITH THIN FILTER.

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Filtered x ray, from the viewpoint of dosage, requires only twice the time for a given number of skin units at full distance as at half distance, whereas in unfiltered dosage four times the time would be required to produce the same effect. This was exemplified both biologically and by pastille in a recent article in the *NEW YORK MEDICAL JOURNAL* (1).

The results in the treatment of basal cell epithelioma are the most striking and encouraging of any of the cancerous lesions, the reason being that basal celled epitheliomata are localized lesions and not metastasizing until very late in the disease, if at all. However, cases that have been allowed to go without treatment until the disease is rather extensive, invading mucous membrane and showing marked induration, do not always do well with routine unfiltered treatment. This applies more particularly to the ulcerated type of epithelioma. It is in this class of cases, as well as in recurrent nodules, that we have used the thin filter. The lesion and from a half to three quarters of an inch of surrounding skin should be subjected to radiation. The rest of the surface must be protected by lead foil, a window being cut in the lead foil to conform to the conditions and shape of the growth.

A filter of one quarter of a millimetre of aluminum is used, the factors for treatment being a six inch spark gap, five milliamperes, ten inch distance, with a time varying from three to seven minutes (one and one half to two and one half skin units), depending on the severity of the case.

While our work has been done with one quarter of a millimetre of aluminum, we consider this

purely arbitrary, as from one quarter to three quarters of a millimetre of aluminum may be used, provided one and one half to two and one half skin units of filtered ray are obtained. Although the number of cases thus far treated with a thin filter have been somewhat limited, and the results obtained are not of long standing, we are using this method in those cases that do not do well with the routine unfiltered method.

The advantages of filtered x ray over the intensive dosage of unfiltered x ray are: 1. The filtered dose enables one to repeat the treatment in from three to four weeks, preferably three weeks, without causing any degree of local reaction. 2. These treatments at short intervals should produce more favorable results owing to the direct action of the ray on those cells which are undergoing mitosis. In other words, the action of the x ray on embryonic cells is dependent on the principle that the cells during certain phases of mitoses are easily destroyed by moderate amounts of x ray. Also, as the cells are constantly undergoing mitosis, it seems reasonable that more cells will be found in the sensitive phase and destroyed by the ray when applied at more frequent intervals. 3. The size of the dose in filtered x ray is correspondingly less than the unfiltered and would tend to produce less severe reactions, and consequently less danger to the eye or any other sensitive mucosa. 4. This method is applicable for use with the smaller (2 kw.) machine, which is commonly used in superficial or unfiltered treatment.

REFERENCES.

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SUPERFICIAL AND DEEP ROENTGEN DOSE ESTIMATION.

Abstract of Several Lectures.

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Many methods of superficial röntgen dose estimation have been devised, lengthy descriptions of which exist in medical literature and will therefore be omitted here. However, three important facts, if not faults, common to the several radiometers are: First, that they indicate the local skin erythema reaction only, and give no clue to either the subcutaneous or true biological effect; second, that the erythema reaction is measurable with a reasonable degree of accuracy only when that particular ray quality (penetration) is employed for which the particular instrument was graded; third, that none of the meters indicate the erythema reaction when variable filter thicknesses are employed.

A table (Fig. 1) is here appended giving the approximate values of several of the most popular radiometers. However, at the risk of repetition, it is to be remembered that the higher the penetration, or the stronger the filtration, the greater is the necessary radiometer reading in order to produce an

erythema; and conversely, the lower the penetration (below that for which the particular instrument was devised), the lower the numerical reading.

For average radiographic purposes with unfiltered rays, the formula $\frac{A \times V^2 \times T}{D^2} = I$ is quite satis-

factory. To be sure, some variation will occur at the extremes of penetration, due to change in reaction of the silver salts with rays of varying wave length. On the other hand, this formula cannot be strictly applied when dealing with pastilles in relation to the erythema reaction. Experience has shown that employing the Sabouraud scale and varying the penetration, for example, with parallel spark backups of four, six, and nine inches, then an erythema would obtain at readings of .8,—1., and 1.2,—tint B Sabouraud respectively.

Instrument	Erythema Tube Dose					Hard Tube
Sabouraud Tint and Noire	1/5	3/8	3/5	4/5	1B	1.5B
Holtzknecht	1	2	3	4	5	8+
Bordier			0	0.1	1	10
Hampson		4	8	12	15	20
Schwartz		1	2		5.5	
Kienbock	1	2	3	4	5	7
Szillard					10	15

FIG. 1.—Four comparative radiometer values. In employing the various radiometers it is important to use that tube quality for which the instrument was graded. Only under these conditions are these relative values correct. An example of the variations that will otherwise occur is shown in the last column, where the various readings with a tube of high penetration are given.

A graphic illustration of these variations is shown in Fig. 2. The dose time for an erythema reaction has been calculated for the several backups ranging between two and ten inches, with a fixed skin focus distance of seven and one half inches and with the indicated M. A.

For an explanation of the aforementioned apparent empiricism, one would naturally turn to the various penetrometer measures.

A table of the better known penetrometers (Fig. 3) is herewith appended, arranged as closely as possible to their relative numerical values. In looking over these scales, one notes that the only one of the older methods that associates penetration and intensity is the half absorption rate of Christen. Here the factors are, a, incident intensity; b, one half of incident intensity or the transmitted intensity through; c, various thicknesses of a substance, water in various cm. depths (1), in order to show the thickness necessary to cut the intensity in half. In other words, the cm. depth of water necessary to absorb fifty per cent. of the incident beam.

I prefer and employ a fixed thickness of substance, usually one mm. aluminum, and determine the absorption percentage under varying conditions of penetration and filtration. This is accomplished with two rotating (or sliding) röntgen opaque discs revolving concentrically, one about one inch larger than the other. The larger is about three inches in diameter and has a half open section cut in the periphery; the smaller has only a quarter section removed. These are made to rotate (or slide) in such a way (the smaller at one half the time of the

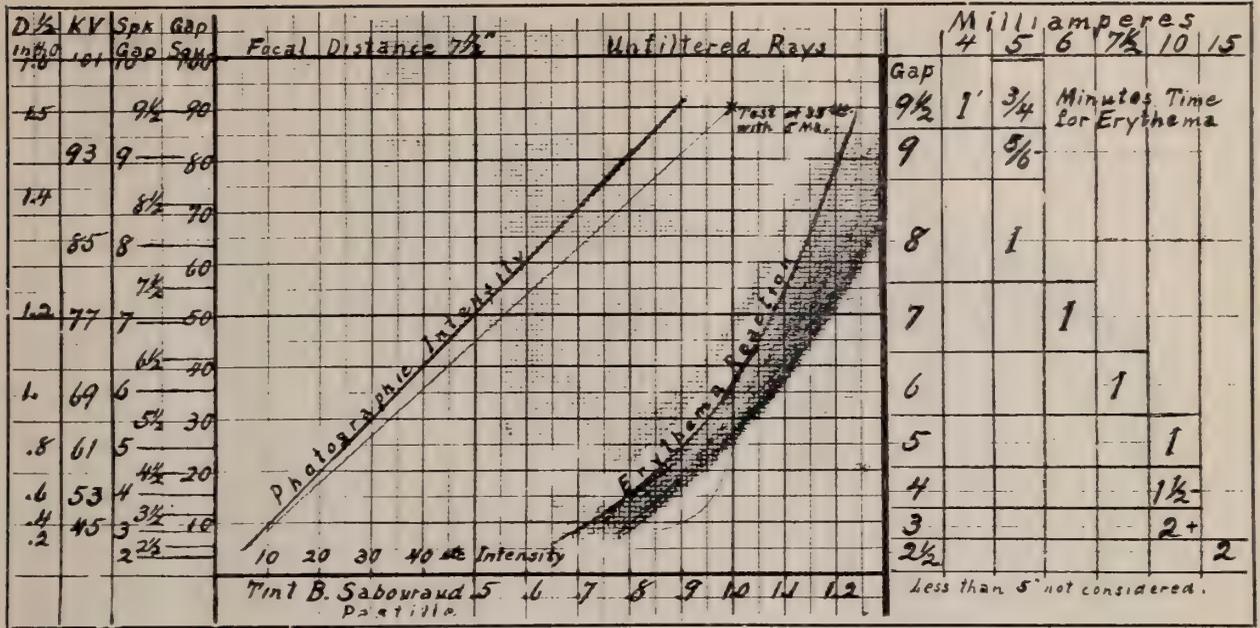


Fig. 2.—Photographic and pastille intensity vis erythema reaction. In the first vertical column will be found the half absorption rate of Christen as compared with the kilo volts in the second column, and the parallel gap in the third column; the square of the gap is shown next to the diagram. Along the bottom of the diagram the relative intensity values are given. The oblique line represents the variations in photographic intensity, according to the rule $\frac{A \times V^2 \times T}{D^2} = I$, in which A equals quantity expressed in milliamperes, V equals quality expressed in the square of the spark gap, T equals time, and D equals distance. The curved shaded area represents the zone of erythema reaction in relation to the penetration and intensity, but with the latter graded according to the Sabouraud scale. In the last columns, the milliamperes and minutes time for an erythema reaction with unfiltered rays and various backups are given calculated from the chart. These figures the author believes the maximum with which present day tubes should be taxed, and then only when good cooling conditions obtain.

larger) that during a full continuous exposure under the outer disc, a graded exposure from 0 to full time occurs under the inner disc. The percentage of absorption for any substance of a given thickness can thus be determined. Fig. 4 shows the author's penetrometer or absorption meter with a sketch of the result obtained with a tube of medium penetration. We can also gain a rough idea of the absorp-

equals the absorption for the given thickness of substance.

Notwithstanding that secondary ray effects play a part in the transmitted intensity, and though the character of the ray be altered by filtration, it still

Instrument	Spark Gap in Air Inches below points	Kilo-Volts secondary	Bauer mm sheet lead	Benoist mm Al. vis Ag.	Benoist-Walter mm Al.	Wehnelt	Walter mm Pt.	Christen d 1/2 in H2O	Absorption % in 1 mm Al.-Meyer
	2 3 4 5 6 7 8 9 10 11 12	37 45 53 61 69 77 85 93 101	2 3 4 5 6 7 8	2 3 4 5 6 7 8 9	1 2 3 4 5 6	2 3 4 5 6 7 8 9 10 11 12	3 4 5 6 7 8	2 4 6 8 1. 1.2 1.4 1.6 1.8	80 70 65 60 55 50 45 40

Fig. 3.—Comparative penetrometer values.

tion rate with the present day radiometers. If, for example, we place one Kienbock strip or Sabouraud pastille over a mm. thickness of aluminum, and another strip or pastille under the aluminum; after exposure at standard distance we would have the incident dose on the upper and the transmitted dose on the under strip or pastille. Thus we can say that the incident dose minus the transmitted dose

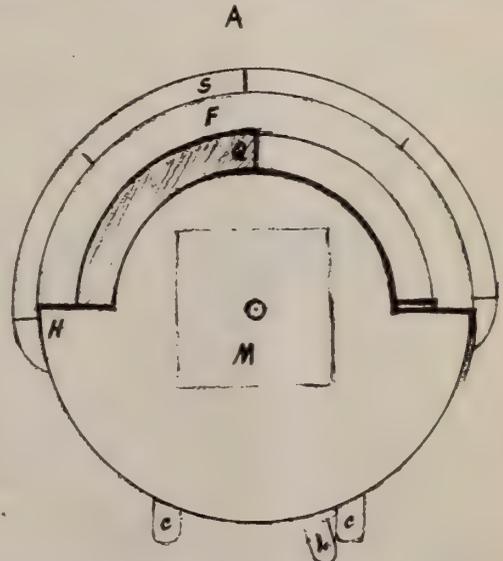


Fig. 4.—A.—Author's absorption penetrometer. A schematic illustration of absorption penetrometer: S, Graded sector, to read in absorption percent; F, fixed segment of one mm. aluminum; H, rotating disc with half section removed from periphery; Q, disc rotating at half time of H with quarter section removed from edge; M, operating mechanism; L, starting lever; c, clamps.

remains a fact that the absorption as indicated by a mm. thickness of aluminum, when taken in conjunction with the several radiometer readings, gives a close index of skin tolerance or the erythema dose.

Due to the difficulty of obtaining standardized

materials of continental origin during the war, the author constructed his own radiometer, using carbon velox paper. The standard tint was graded in one tenth erythema dose, using unfiltered rays with a tube backup of six inches, the maximum tint equivalent to three times an erythema reaction.

B

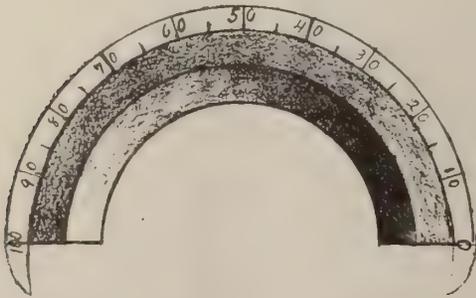


FIG. 4. B.—Author's absorption penetrometer, presenting a sketch of result of test with a tube showing 50 per cent. absorption in one mm. aluminum. The outer segment of even shade is the uniform exposure obtained under one mm. aluminum. The graded shaded inner segment has been produced by the revolving double discs allowing a graded exposure. Exposing from full time at 0—to nothing at 100. Where the shades of the two segments match a direct reading of the absorption percent can be obtained N. B. Any thickness of any desired substance can be substituted for the one mm. aluminum above used.

The double strip readings were used to determine the absorption percentage. The instrument was so constructed that a direct reading of the total cumulative absorption was possible.

The principle involved can be illustrated as follows: If we ray through a filter of three and one half mm. of aluminum with a tube backing up a nine and one half inch parallel gap, until a photographic strip shows the equivalent of $10\times$ Kienbock; then a second strip under a mm. of aluminum (both immediately under the first strip) would register $8\times$. (Fig. 5.) Further; if we accept the $10\times$ as standard for surface dose measure and call it an incident dose of one hundred per cent., then the

rate is still twenty per cent. However, if, as mentioned above, we accept the $10\times$ as standard representing one hundred per cent. surface intensity, then the difference between $16\times$ and $20\times$ in the second example will represent a total cumulative time absorption of 40.

It will be shown that an erythema reaction requires a total cumulative dose time absorption of over fifty per cent.; thus, in this particular example, the uppermost strip must record over $25\times$ and the lower strip over $20\times$, so that the total cumulative absorption in one mm. aluminum exceeds 50.

If we study the varying absorption with tubes of varying penetration, as illustrated in Fig. 5, and again the altered absorption, when using different filter thickness as illustrated in Fig. 11, then one will realize the futility of surface dose measurement and the advantage of the far more accurate dose estimation by total cumulative absorption.

It has been stated that the erythema reaction is indicated by one tint B Sabouraud only when unfiltered rays with about a six inch backup are used. Under these conditions, the absorption in one mm. aluminum approaches fifty per cent. of the incident beam. It will also be seen that with a softer tube, the absorption rate rises, and that less than a pastille dose is required to produce an erythema. Again with hard and, above all, with filtered rays, the absorption rate decreases, whereas the number of pastille doses necessary to produce a skin reaction increases markedly. The fact to which I wish to call attention here is that if one multiply the absorption in one mm. of aluminum by the number of unit pastille doses necessary to produce an erythema, the total cumulative absorption in the first mm. thickness of aluminum invariably approximates 50 .¹

To be sure, this percentage should be somewhat higher when strongly filtered rays are employed, since with such rays the transmission through a

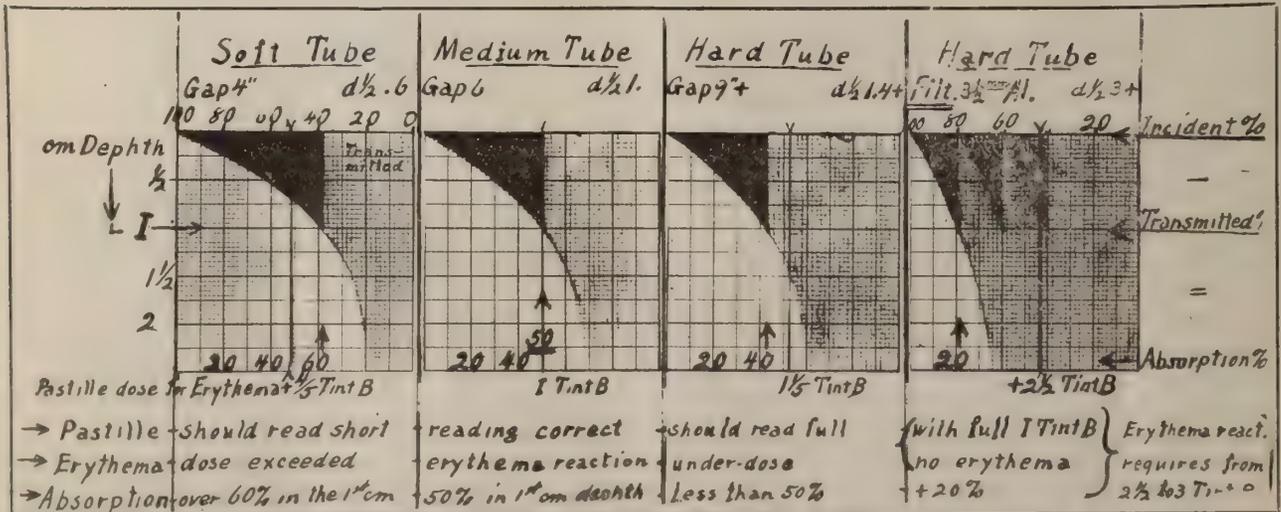


FIG. 5.—Schematic illustration of the absorption in the first cm. depth of tissue in relation to pastille dose and the actual erythema.

transmitted dose through one mm. aluminum equals eighty per cent. and the absorption equals the difference, or twenty per cent.

If we ray further until the strip over the one mm. aluminum shows $20\times$, then the strip under the mm. will register $16\times$. To be sure, the absorption

given thickness of substance is more uniform, whereas the maximum absorption in the superficial layers is most pronounced with soft unfiltered rays.

¹An indifferent skin surface is here suggested, that is, the skin of the back or an extensor surface. The skin of the face, neck, axilla, groin, and flexor surfaces generally being more sensitive.

A graphic illustration of the absorption rate with tubes of varying penetration, along with the pastille dose necessary to produce an erythema, will be seen in Fig. 5.

Experimentally and in practice, it is a fact that if to human skin we give the pastille doses with the backup and filtration indicated in Fig. 5, an erythema and epilation will invariably result.

The successive steps in the line of reasoning thus far are:

1. The assumption that the absorption of one mm. aluminum is practically equal to the absorption in one cm. of water, and this in turn is approximately equal to the absorption in one cm. of human flesh. Thus the absorption in one mm. aluminum is roughly equivalent to the absorption in one cm. of human flesh² (2).

2. With unfiltered rays and a medium tube, a pastille dose delivered to the skin will result in an erythema and temporary epilation (Fig. 1), as well as checking the function of the sebaceous and sweat glands.

3. The pastille dose achieved with a medium tube and unfiltered rays shows a half absorption of fifty per cent. in one cm. of water (3). This in turn is roughly equal to the same absorption in one mm. aluminum³ (Fig. 3).

4. An erythema will result, irrespective of penetration or filtration, providing the total cumulative absorption exceeds 50 in the first cm. of flesh as measured in one mm. of aluminum (Fig. 5).

5. Since, irrespective of penetration or filtration, a cumulative time absorption of over 50 in one cm. of human flesh produces an inhibitory action on cells of special function, then it is reasonable to assume that, irrespective of depth, the metabolic process of radiosensitive structures should be subject to inhibition when the total cumulative time absorption per cent. per cm. exceeds 50.⁴

²I do not wish to affirm that the absorption rate in the first cm. depth of tissue, as measured in one mm. aluminum, is an absolute measure of skin or biological reaction. As a matter of fact, the absorption in the half cm. is a better guide, and the absorption per mm. depth of tissue still more accurate. However, for average purposes, the method employed has proven sufficient.

³If one will study the ever changing absorption in the first cm. depth, as measured in one mm. aluminum, even with fixed backup, but employing various filter thicknesses (Fig. 12), one will realize that no such single rule as originally devised by Wetherbee and

Remer, i.e., $\frac{A \times \sqrt{x} \times T}{D}$ = I can apply, excepting in a single specific

instance. In their more recent communications, this has perhaps inadvertently been admitted by the injection of multiple exceptions with varying filter thicknesses.

That the dose time for an erythema reaction is shortened by supposed increased penetration with unfiltered rays, is due to the fact that the whole heterogeneous ray complex is increased with the surface intensity, varying roughly as the square of the parallel spark backup. However, as shown in Fig. 2, this cannot be unconditionally accepted as the measure of skin reaction, since the absorption rate varies with change of backup. Therefore, surface dosage is no more an index to erythema reaction than either of these is to the biological reaction, unless considered in relation to absorption.

⁴From some fifteen years' experience, I have arrived at the following conclusions: a. That with unfiltered rays, an erythema will result with a dose time absorption of fifty per cent. in the first cm. of flesh as measured in one mm. aluminum. b. That with filtered rays, the dose time will have to be continued until the cumulative absorption in the first cm. approximates sixty per cent. c. If a similar reaction is desired in the deeper seated structures, the cumulative absorption will have to be somewhat increased because of the increased filtration produced by the overlying tissue thickness.

With due respect for the opinion of such investigators as Belot (7), Spéder (8), and Régaud (9), there are others, myself included, who believe that with sufficient dosage, very similar skin reactions can be brought about, be the radiations soft or hard, filtered or unfiltered, röntgen ray, or radium.

In drawing conclusions from measured absorption, it must be remembered that the higher the penetration and the stronger the filtration, the less the superficial absorption. Therefore, when comparing reactions with soft and hard rays, the unit of measure will have to be exceedingly small, before offering too definite an opinion.

6. a. Experience has shown that less than a pastille dose with unfiltered rays to the skin is stimulative in action. (For mild stimulation, I employ one fourth to one third pastille dose, and for very strong stimulation from one half to two thirds pastille dose. These represent respectively a total cumulative absorption of fifteen to twenty, and twenty-five to thirty-five per cent. per cm. depth of tissue.)

b. The pastille dose with unfiltered rays (representing approximately fifty per cent. total cumulative absorption in the first cm.) is the erythema dose and generally recognized as of passing inhibitive action to cells of special function.

c. A double pastille dose with unfiltered rays has been found necessary to produce a more profound inhibitive action with retrogression (McKee and others); this in turn equals a total cumulative absorption of about 100.

d. Complete destruction with necrosis will occur with from two hundred to two hundred and fifty per cent. total cumulative absorption.

The lethal dose in malignancy has been variously estimated at from one and one half to four skin doses. I believe that the total destruction of malignant tissue should be the aim; not allowing some cell elements to remain to light up at a future date. The latter has all too frequently been the case where momentary brilliant results have been obtained.

To summarize röntgen dosage in relation to the total cumulative absorption per cm. depth:

Action.....	Stimulative		Inhibitive		Destructive Total
	Mild	Strong	Mod.	Prolonged	
Total cum. absorption per cent. per cm. depth.	10 to 20	25 to 35	50 to 60	100 to 120	200 to 250
Biological effect	Increased metabolism Passing		Anabolic Prolonged		Catabolic
Period.....	Repetition of dosage necessary for continuation of effect.		Possible recovery in from one to three years.		Ulceration and necrosis. Slow to heal with scar tissue formation.

Since under varying degrees of penetration and filtration and for deep therapy, the present day radiometers do not indicate the various reactions; and since the total cumulative absorption per cm. depth does, then this is the logical method of dosimetry.

Thus, whether the lesion be superficial or deep, the factors to be determined are: First, whether stimulation, inhibition, or destruction is indicated; second, what quantity and penetration, filtration, distance and time, and in deep cases what number of areas for crossfire are necessary to bring about the desired total cumulative absorption at the site of the lesion; third, protection of normal tissues as far as possible with special attention in deep cases to normal skin tolerance. Every means at our disposal should be employed to arrive at a correct diagnosis with a definite notion as to the location and extent of the lesion. It must also be remembered that along the path of a single beam of x rays, various reactions may occur. Thus we may have destruction with necrosis at the skin surface; immediately beneath this a strong inhibitive reaction may

occur, while but a little deeper we will have a stimulative action diminishing as the depth increases.

Again, at the same plane, all three reactions may occur, depending upon the radiosensitivity of the structures involved. From observations too numerous to mention here it can be said that organs of highly specialized function, tissues of embryonal type, young or rapidly growing structures, multiple small cells with large nuclei and rich in chromatine, are all highly radiosensitive.

These facts are so closely associated with high atomic weight and specific gravity, that a chart is herewith appended (Fig. 6), and it appears to indicate that the higher the atomic weight and specific gravity of a living structure, the greater is the radiosensitivity.

Specific Gravity	High	
1.75	Bone—young
	Bone—old
1.50	Cartilage—young
1.25	Cartilage—old
1.1	Ovaries
	Skin
	Epithelium
1.09	Glandular
	Red blood corpuscles 1 .88
	Connective tissue
1.08	Mucous membrane
	Spleen
	Liver
	Kidney
1.06	White blood cells
	Muscle
	Blood 1.062
	1.055
1.05	Brain
1.04	
1.03	Blood serum 1.03
	1.025
1.02	
1.00	Water
	Fat
	Low	

FIG. 6.—Chart showing the relation of radiosensitivity and specific weight. Tissues and organs in order of approximate radiosensitivity are: Testicle, ovary, choroid, thyroid, intima of blood vessels, lymph glands, epithelium of mucous membrane, hair follicle, glands, and epithelium of skin.

It remains then to determine with what penetration and filtration and with how many areas the desired total cumulative absorption can be brought to bear. As far as superficial conditions are concerned, the chart in Fig. 5 speaks for itself, in so far that in lesions so located, the unfiltered or weakly filtered ray is indicated. The more superficial the disease, the softer the ray quality. I always employ, however, one sixteenth inch of pressed fibre as a protection from heat, light, corpuscular and the extremely soft rays.

Our greatest difficulty has been with the estimation of deep dosage, and rather than accept mathematical conclusions relative to absorption at various depths, and with due respect for the elaborate studies of Guillemot (4) along the same line, I have preferred my own data drawn from experiments conducted on principles similar to those described by Gaus and Lembcke (6).

In measuring the half absorption rate by the photographic method, as illustrated in Fig. 4, the penetration appears almost double that shown when using either the pastilles or photographic test strips by means of the phantom, as illustrated in Figs. 7 and 8. There is a very close association between the half absorption rates of Christen (1 and 3) and those shown in the table of Guillemot (4). It is quite likely that secondary ray effects may be

responsible for the increased absorption shown in the upper strata in the method employed by me. The question is, Are not such secondary rays effective in the body as well? (5). Be that as it may, the area selection as practised here shows results, whereas a lesser number of areas of crossfire, as might be indicated by the half absorption rate, has in our hands failed.

The method of carrying out these experiments is illustrated in Figs. 7, 8, and 9. In Fig. 7 waterproofed photographic strips (or pastilles) are arranged vertically at cm. spacings, and the whole submerged in water. After exposure the intensity of each is determined, from which a transmission curve is constructed, such as those illustrated in Fig. 8. The result of such an experiment is illustrated in Fig. 9. Here the Kienbock strips used lend themselves well to photographic reproduction. The distance, depth, and transmission rate will be noted in the various columns. In this manner the best ray quality and filtration is determined, which gives the maximum absorption at the various cm.

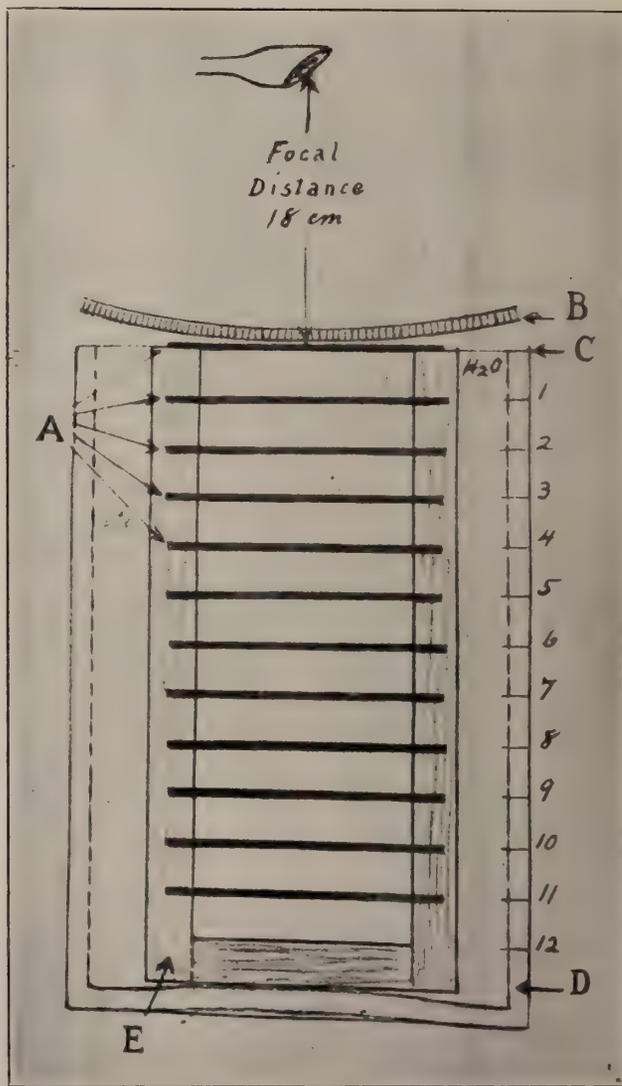


FIG. 7.—Measuring transmission (schematic). E represents a wooden frame so notched as to receive the Kienbock test strips, indicated by the letter A. Each strip is one centimetre lower than its immediate predecessor. This frame is submerged in water contained in the jar D; the water at a level with the uppermost strip and in close apposition with the filter B.

depths. From many such experiments, the composite results of which are shown in the charts in Figs. 10 and 11, the final chart in Fig. 12 has been compiled. On the surface the pastille may be used, though the absorption in the first cm. is the surest guide. Below the surface, be the depth the first or the tenth cm., the absorption is the dose measure.

I have taken as standard the strong inhibitive dose as represented by a total cumulative absorption of one hundred per cent. In the first two vertical columns of the chart in Fig. 12 will be found the skin focus distance and the depth below the skin surface in cm. and inches. In the third vertical column the most desirable filter thickness is given, with a tube of the indicated hardness; the absorption rate will be found in the fourth column, and in the last four columns, the number of areas for multiple crossfire will be found. (The oblique line roughly indicates the dividing line between, under and over skin reaction. Thus in the third column we expect an erythema.) Using a hypothetical example, if we had a lesion situated at about the

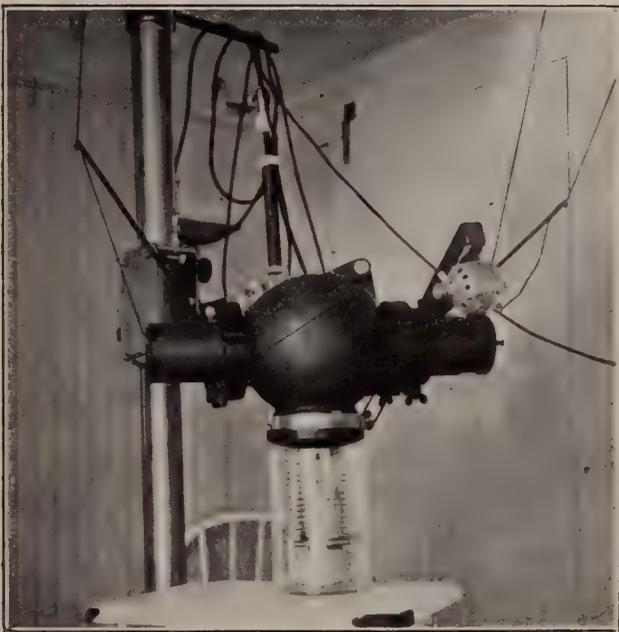


FIG. 8.—Measuring transmission (actual testing conditions).

fourth and fifth cm. depth in which a strong inhibitive action was desired, yet a skin reaction was not justifiable, then the most desirable filter thickness would be three to four mm. aluminum and the number of areas with maximum safe dosage would be five to six, found in the double pastille dose column.

It is evident that each area must be large enough to include the whole of the lesion, and the direction and depth reasonably correct. The most frequent causes of error with a technic as accurate as the foregoing, are incorrect diagnosis, and faulty posture; thus failure to obtain the proper total cumulative absorption. Fortunately, I have had the opportunity to put the foregoing to practical test and am ready to report numerous cases:

1. As illustration of superficial dose estimation by absorption, one hundred consecutive cases of

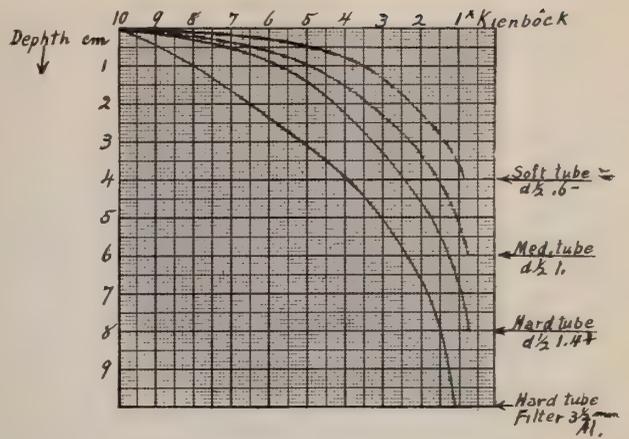


FIG. 9.—Transmission curves, with varying penetration and with filtration.

epithelioma and rodent ulcer and chronic ulcerating warts and moles (malignant) successfully removed within a period of one to two months following a single application, with but a single recurrence within a period of three years. 2. As illustration of deeper dosage estimation, one hundred consecutive cases of hyperthyroidism and thymic enlargement, with clinical cessation of symptoms in every case. 3. As illustration of deep seated conditions, twenty-five consecutive cases in which complete amenorrhea was produced in a single sitting. Also a similar number of cases of splenomegaly, lymphoma (Hodgkin's disease), etc., with disappearance of the mass in from one to three months.

Other conditions treated and the classification employed are as follows:

1. Mild stimulation: Superficial skin lesions—

Transmission Rate without and with Filtration

		Coolidge Tube Broad focus			
		Filament 39 Amps	Paral. Gap 9 1/2" (Points)		
		Rheostat 7 Bullon	Kilo-Volts 98		
		Inductance 19-P.V. 212	Bauer 8+(Benoist)		
		Milliamps 5	4 1/2 in Al. 1.6 mm		
		(Exp A) High Penetration	(Exp B)		
		1/2 Min.	-Dose Time-	1/4 Min.	
		None	Filter	3 3/8 Al.	
Focal Distance	XUnits	kien böck	XUnits	Depth below Surface	
19 cm	10x			0	Surface
20	6-			8-	1 cm
21	4+			7-	2 "
22	3+			5+	3 "
23	2-			5-	4 "
24	1+			4-	5 "
25	1-			3-	6 "
26	1/2			2-	7 "
27	+			1+	8 "
28				1-	9 "
29				1/2+	10 "

FIG. 10.—Transmission rate without and with filtration (Kienböck test strips). The result of two experiments carried out as described and shown in Figs. 7 and 8. Experiment A, with no filter. Experiment B, with filter. The two central columns are the Kienböck strips; the columns on either side of the strips represent the approximate Kienböck readings; the column to the extreme left, the strip focus distance; the column to the extreme right, the centimetre depth of the strips in water. The comparative tints of the transmitted intensity of both tests is clearly shown; the marked improvement with the filter is quite evident.

Tube High Penetration $d\frac{1}{2}$ Al. 1.4 mm								
Focal Distance 19 cm								
Time Exposure	1	1.1	1 $\frac{3}{4}$	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	
X Units unfiltered	10 ^x	11 ^x	17.5 ^x	20 ^x	25 ^x	30 ^x	35 ^x	
Filter thickness mm Al.	0	$\frac{1}{2}$	1 $\frac{1}{2}$	2 $\frac{1}{4}$	3 $\frac{1}{2}$	4 $\frac{1}{2}$	5 $\frac{1}{2}$	
Depth cm	10 ^x	Surface Dose 10 ^x Kienbock.						10 ^x
1 ^{cm}	5.5 ⁺	6.6 ⁺	7.	7.8	8.	8.	7	
2	4.5-	5.2	5.5	6.6	6.4	6.4	5.8	
3	3.5-	4.	4.3	5.2	5.	5.2	5.	
4	2.5-	3.	3.3	4.	3.8	4.4	4.2	
5	2-	2 ⁺	3 ⁺	3 ⁺	3.5 ⁺			
6	1.7	2.2	2.5	3.1	3.	3.6	3.5	
7	1.5	1.8 ⁺	2-	2.5-	2.5-	3-	3-	
8	1.3	1.6	1.8	2.4	2.3	2.8	2.8	
9	1-	1 ⁺	1.5-	2-	2-	2-	2 ⁺	
10	.9	1.3	1.4	1.8	1.8	1.9	2.1	
		1-	1 ⁺	1.5-	1.5-	1.5-	1.5 ⁺	
			1.	1.2	1.3	1.3	1.4	
			1-	1 ⁺	1 ⁺	1 ⁺	1 ⁺	
			1.	1.1	1.1	1.1	1.2	

Small figures + or - are Kienbock readings, Fig. 11.—Table of transmission rate.

chronic ulcer, eczema, seborrhea, psoriasis, lichen, prurigo, syphilides, and acne vulgaris.

2. Strong stimulation: a. Superficial—tuberculides, lupus vulgaris, sycosis (nonparasitic), fissure, leucoplasia, neurodermatitis. b. Deep—tuberculous

Filter thickness mm Al.	0	$\frac{1}{2}$	1 $\frac{1}{2}$	2 $\frac{1}{4}$	3 $\frac{1}{2}$	4 $\frac{1}{2}$	5 $\frac{1}{2}$	8
Depth cm	Surface Dose 10 ^x Kienbock							
1	45%	34%	30%	22%	20%	20%	25%	25%
2	12%	14	15	18	16	16	12	10
3	10%	12	12	14	14	12	8	8
4	9%	10	10	12	12	8	8	8
5	7%	8	8	9	8	8	7	7
6	4%	6	7	7	7	8	7	7
7	3%	3	4	6	5	7?	7	7
8				4	3	4	6?	6?
9	Small figures with + or - are from Kienbock readings.			2	2	3	5?	5?
10	Large figures are estimated absorption						4?	4?

FIG. 12.—Table of absorption rate in various cm. depth with various filters and high penetrating rays.

(adenitis and lung), anemia (pernicious), lymphadenitis, leucemia, neuritis, arthritis deformans.

3. Moderate inhibition: Superficial—trichophytosis, sycosis (parasitic) hyperhidrosis and bromidrosis, pruritis, superficial naevi.

4. Strong inhibition (with filtration): a. Superficial—keloid; naevi, hypertrichosis. b. Deep—menorrhagia, metrorrhagia, myoma uteri, prostatic hypertrophy, goitre (hyperthyroidism), lymphoma, Hodgkin's disease, splenomegaly, thymic hypertrophy.

5. Destruction: a. Superficial—verrucae, moles, epithelioma, rodent ulcer. b. Deep—carcinoma, sarcoma.

CONCLUSIONS.

Well cognizant of the fact that certain structures, both normal and pathological, show a pronounced radiosensitivity, yet in connection with the absorp-

Focal Distance 7 $\frac{1}{2}$ 19 cm	Hard Tube Gap 9 $\frac{1}{2}$ d $\frac{1}{2}$ Al.		Number of Areas + Surface dosage to obtain 100% total cumulative absorption = (Strong Inhibitive action) in various cm depths			
	Filter thickness mm Al.	approximate Absorption %	Pastille Single	Double	Triple	Quadple
1	0	+ 43%				
	2 to 3	15	7	4	3	2
	3 to 4	12	8	4	3	2
	" "	10	10	5	4	3
2	5 " "	8 to 9	12	6	4	3
	4 to 5	6 to 7	15	8	6	4
	" "	5 to 6	20	10	7	5
3	5 to 6	4 to 5		12	8	6
	" "	3 to 4		15	11	8
4	10 " "	2 to 3		20	15	10

FIG. 13.—Table of deep dosage estimation and area computation.

tion in one cm. of flesh as measured in one mm. aluminum with present day apparatus, the following conclusions are justifiable:

That a total cumulative absorption percentage of thirty-five or less is stimulative in action (increased metabolism).

That a total cumulative absorption of plus fifty is mildly inhibitive in action to radiosensitive structures.

That a total cumulative absorption of one hundred produces strong inhibition with retrogression.

That a total cumulative absorption of plus two hundred is catabolic in action with retrogression and necrosis.

That any of these effects may be produced at will within the first half cm. depth of tissue.

That as a rule only the first three reactions can be brought to bear below the first cm. depth, without producing, at the same time, total skin destruction. Therefore, with wide spread, deep seated lesions, besides stimulation, an inhibitive dose is frequently all that can be hoped for.

From these conclusions I wish to go on record as stating, without reservation, that any superficial malignancy can be destroyed; and that with the early

cases a far better cosmetic result can be obtained with radiant energy than with any other procedure, and this without pain or inconvenience and frequently within one month following a single treatment; and that, when properly applied, recurrence within three years is rare. Therefore, any case of

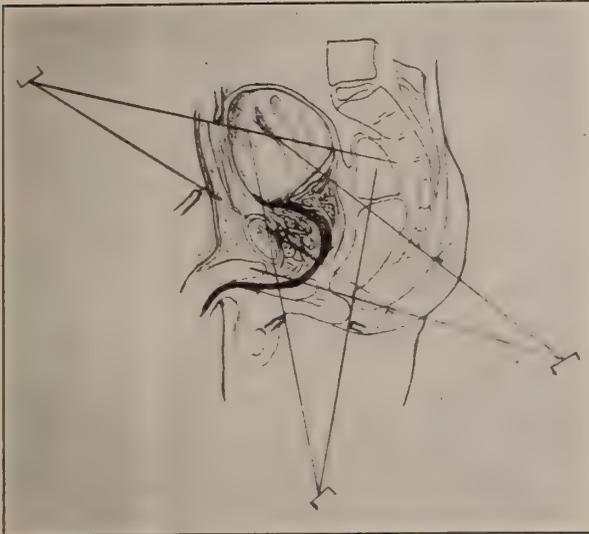


FIG. 14.—Three large and satisfactory areas for crossfire of the pelvic viscera. It will be noticed that each area is sufficiently large to include practically the whole of the true pelvis.

threatened superficial malignancy should receive the benefit of such procedure, and this in preference to the knife, caustics, freezing, or any other method, since our most difficult cases have been those subject to such previous interference.

On the other hand, as far as I am aware, in few *bona fide* cases of deep seated malignancy have the patients been reported as having been cured and remaining alive and well for a minimum period of three years. This may partly be explained by the fact that as a rule the radiologist does not see cases of malignancy until every possible surgical procedure has been attempted, and the patient is practically moribund when presented for treatment. There is not the least doubt that in many cases of malig-

nancy the patients have been improved (12). Hemorrhage can be controlled, foul discharge reduced, pain relieved, ulcers made to film over, and occasionally by shrinking and retrogression (13), an otherwise hopeless case may be brought within the pale of operative intervention. Again, experience has shown that both pre-operative and postoperative radiation are indicated.

Though the present outlook in these cases of deep seated malignancy is not over promising, yet I am far from giving up hope in regard to röntgen treatment. The road to complete success appears to lead along the lines above described—not in the excessively filtered, over penetrative and scanty gamma rays (10), for these lack both intensity in quantity (11) and absorption, and, as a matter of fact, excepting perhaps in the hollow organs, nothing has as yet been accomplished with radium that has not been done before with the x rays. Therefore, in apparatus of greater capacity and tubes to stand the output that we may have quantity (14) and penetration plus absorption, lie the future and hope of röntgen therapy.

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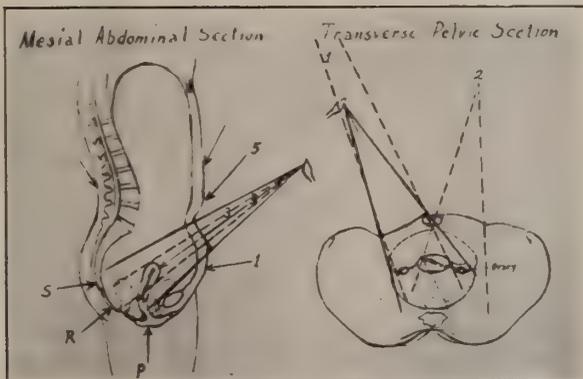


FIG. 15.—Correct and faulty technic. The usual errors that occur by using too small areas, or by incorrect focusing. In the mesial abdominal section the heavy lines from target to patient show the advantage of the large area as compared with the small cone of dotted lines representing a smaller diaphragm or area. The failure to include all the viscera one desires to affect is illustrated by the dotted lines in the transverse section. It will be seen that by incorrect focusing or too great a focal distance even with the same sized diaphragm, certain pelvic organs will not be included in the given exposure.

Duality of the Syphilitic Virus.—Milian (*Presse medicale*, June 19, 1920) believes in the duality of the germ of syphilis. In fact, he thinks distinction of tissues as regards the germ may be pushed still further, i. e., that some of the germs have an affinity for bones, others for the arterial system, etc. To induce tabes or general paralysis it is not sufficient, however, that the germ be neurotropic. In tabetics gummata are not ordinarily seen; leucoplasia, on the other hand, is frequent. Tabes and leucoplasia are affections of the same order, due to a germ of the same nature. Thus, it is not merely the factor of tissue tropism, but also that of special virulence, which make for resistance of the disease to treatment. Inoculation of leucoplasia tissue into the testicle of the rabbit produces lesions similar to those which Levaditi obtained with the blood of cases of general paralysis.

THE STEREOSCOPIC CAMPIMETER SLATE.

*Demonstration at the New York Ophthalmic
Hospital During the Clinical Congress.*

BY RALPH I. LLOYD, M. D., F. A. C. S.,
Brooklyn, N. Y.

If one gazes, without deviation, at a certain point, there is for each eye a surrounding area within which one is able to recognize colors and objects. Each color has a field of different size; white is the largest, extending 55° above the fixing point, 60° internal, 70° below and 90° external to this same point. Blue has a field somewhat smaller than white, red is smaller than the blue, and green is the smallest field of all. Visual acuity is not the same throughout the field, neither are the functions of the field the same in all parts. A diagram may be made to show how the visual acuity at the periphery is almost zero and increases as we approach the fixing area; so the diagram appears like a high mountain with steep slopes on either side. A formula has been offered to represent the rapid shading off of visual acuity as we pass from the centre toward the periphery. Representing perfect central visual acuity as one, the vision at any degree may be roughly estimated by dividing one by the distance from the centre multiplied by three, one divided by three n : (n equals distance from centre). The functions of the retina in different parts are also of interest and have a direct bearing upon the topic.

The central area is especially fitted for reading and noting fine detail and is practically vision, as it is usually understood. Vision of detail and a good part of color vision are located in the small central area. Without these, one is practically blind as we can easily understand if detail is eliminated from everything we look at and mass vision substituted. To be sure, the individual if afflicted in this way, would not bump into objects or persons as he walked along, even in strange places, but over the centre of the precise place where his vision was directed for obtaining an exact visual impression, would be a vacancy. He would know that large objects were round about him, would know just where to put his feet and where not to, would know whether the sun shone or not but could not read or obtain visual impressions except in mass form. His color vision would be defective also. But if there was a movement at the side, he would be instantly aware that something was going on there and would involuntarily turn his eyes as had been his habit and must be the habit of all mankind, to have the image of the area whence came the movement fall upon the central area, which would, if normal, give him all the detail of the small field upon which the fixing area was centred. Rapidly then, his busy eyes, for even the proverbial bee is no busier, would move around to allow the image of various parts of the part of the room or the floor which was now occupying his conscious effort, to fall in astoundingly rapid succession upon a small but central part of the retina (macular area or area of fixation). After these images have like a moving picture film been passing before the part of the

brain devoted to vision, he will add, as it were, these various pictures together like a mosaic to make a finished single picture or mental image.

The moving picture film is a succession of small but complete pictures; the successive visual impressions are small detailed bits of a large picture which must be added together to get a result, the adding is mental. In this important manner, the moving picture film and the visual impressions differ. Our patient without normal central vision comes now to the end of his day and as the sun goes down, there comes a change. In the dusk of the evening, he sees quite well because vision in dull lights or darkness is mass vision and no impressions of detail are possible. He is under these conditions as good as the next fellow. From the foregoing it is plainly seen that each of the eyes given us is a double organ; divided into a central eye upon which we depend for detail vision and color vision. This part of the eye works best in good light, daylight for instance, and it does not work well in the dark. We can prove that the central eye is normally night blind by a simple experiment. If one will step into a dark room or wait until nightfall for experimenting, and gaze upon a self illuminating watch dial, he will see it dimly. If he turns his eyes slightly to the side and permits this same image to fall upon a part of the retina just a little external to the macular area, the glowing image is clear and distinct. Astronomers know this and tell us that a star is best observed through the telescope by directing the gaze a little to one side of the star they wish to observe, moving the image of the star against the dark background from the night blind macular area over to the night seeing periphery.

The peripheral eye is particularly fitted for noting motion at the side and giving warning of location of things, a most valuable function which we use continually while walking through busy streets, keeping our eye upon the line we are reading, etc. This is called vision of discovery. It works well in daylight but in the dark this part of the eye functions also and does not become night blind. This function in the dark is called achromatic vision. Our patient who lost his central vision, was defective in his color perception and had lost his vision of detail. He got along quite well in the darkness or dull light. The patient who loses his peripheral eye is night blind, cannot protect himself against objects coming at him from the side, bumps into people, but can read, etc.

The retina is made up of rods and cones, the first predominate in the periphery and increase as we proceed from the centre to the outer limit, but the cones exist at the centre, or macular area, to the exclusion of the rods and decrease in number as we go externally. It is conceded that the cones are the organs which give the central eye its characteristics, just as the rods give the peripheral eye the power of vision in dull light and ability to detect motion in either kind of illumination.

Huey and others have studied the action of the human eye and mind in the act of reading and the preceding facts are plain in his conclusions as well as some others. He says the eye appreciates about four letters of average type if held absolutely still.

Another interesting fact is the demonstration that the eye jumps from letter group to letter group in the most amazing fashion and does not naturally remain long in one spot. Steady fixation is not habitual. Reading is done then by letter groups, the main groups being picked out by characteristic form and aid is given by the sense of the sentence already interpreted. Thus in the group of words "The act of reading," no time would be wasted upon the "ing" as the sense of the sentence would indicate that no other termination was reasonable. While the central eye fixes upon about four letters, the contiguous area of the field of vision would give some hint of the form of the letters standing next in line and the area still further out would act as a guide in keeping the jumping eye on the line as it goes rapidly along.

There is one other bit of eye physiology which is of importance to us in discussing or planning instruments for testing various functions of the eye and that is what is known as "phenomena of Troxler." If bright images are held steadily in fixation, some parts will fade and others become bright, and so on. In fact, prolonged fixation without change of field is sure to produce eventually this alternation of supremacy of one part of the image over another, even if the images are subdued.

Graefe was the first one to measure and study the size and shape of the field of vision. In 1855 he mapped out, upon a wall painted black, a series of concentric circles giving the five or ten degree zones from the centre out to 90°, although he used the rectangular method of obtaining these circles instead of the tangential. In spite of the fact that 90° was parallel to the wall and could not be measured thereon, some important facts were soon discovered. Atrophy of the optic nerve produced a narrowing of the field of vision by affecting first green, then red, and finally white, so that the early stages might have a normal sized field for white but a very small one for green.

Various other diseases and conditions affected the field in peculiar ways and were valuable in diagnosis and prognosis. Forster, in 1867, made an instrument with a semicircular arm along which the test object ran, equidistant at all times from the eye. This corrected the error of the Graefe plan. When the flat surface was used, the test object soon got farther and farther from the eye, as it passed laterally and subtending an ever diminishing visual angle, seriously affected the value of the test beyond twenty-five or thirty degrees, according to the distance of the eye under examination from the fixing point. Forster's invention was improved upon from time to time until with the added devices for recording the various points, changing size and color of test object, perfection seemed at hand. The recording surface of the modern perimeter is compressed, as much as twelve times in some, so it happens that the test object will travel on the arc about two inches for ten degrees and one sixth inch is allotted for this space on the recording surface. A ten degree scotoma is indeed a large defect especially near the central portion of the field and it is evident that outlining scotomas is not the function of a perimeter. The perimeter is also

inelastic and permits the approach of the test object from external or internal limit only. The flat surface with test object in the hand of the examiner permits outlining scotomas, especially those near the central area, because of the fact that the test object can approach the defect from any angle and the record made is not compressed but is recorded as large as it appears. Although this distinction in the function of the perimeter and the campimeter is evident, for years the perimeter was used for central field work, but it is now certain that many defects were overlooked.

We might say here, then, that the perimeter is an indispensable instrument for outlining fields of vision for color or white, but the campimeter in some form is indispensable for mapping out defects of the central portion of the field of vision. Bjerrum introduced his screen which is a modification, one might say, of the Graefe flat surface. Bjerrum was aware of the limit of usefulness of the flat surface to the central twenty-five or thirty or forty degrees, according to the distance of the patient from the screen. This screen was a black curtain with concentric five or ten degree circles upon it and was limited as suggested above. Dr. Duane, of New York, modified the screen so the distance from the patient was lessened, but the screen could be raised or lowered to bring the centre opposite the eye of the patient, and the degree markings are placed on one side and squares on the other, so the screen may be also used as a muscle screen. The pins marking the outline of the defect may be inserted from the side opposite to the patient, thus preventing any influence of recording where the patient might observe it.

Haitz in 1907 introduced his charts which were to be observed in an ordinary stereoscope. Other binocular methods had been tried but none so successful or simple as this. The stereoscope was familiar to all but was relegated by most to the position of an entertaining toy. Haitz saw the usefulness and possibilities which others overlooked. He utilized only a ten degree field but each eye could be examined independent of the other, binocular fixation was employed unless one eye was defective, in which case the good eye fixed and held the poor one in position. The perimeter and screen are monocular instruments and if the fixing power of an eye is bad, the eye is unsteady with the expected result upon the record. Haitz charts are made of paper and the recording of the defect necessitated the counting of squares in order to transfer the record to paper for permanency. This slowed up the process and with the unsteadiness inseparable from the hand stereoscope together with the limited field made three unpleasant features.

Dr. Peter, of Philadelphia, soon after this introduced his campimeter which is really a Bjerrum screen brought close to the eye. The available field is about forty degrees, the instrument is easily carried about and may be used with the patient in bed. The defect is recorded upon the campimeter as large as it appears to the patient, and there is no loss of time. It is of necessity somewhat unsteady, as it is held in the hand and is a monocular device.

The blind spot has been known since Mariotte

discovered it in the year 1668, but only in recent years has it entered into field study as an important factor. Coccius showed in 1859 that glaucoma enlarged the blind spot and Leber, 1869, proved its enlargement in tobacco poisoning. But in recent years, it has been thoroughly studied, and blind spot

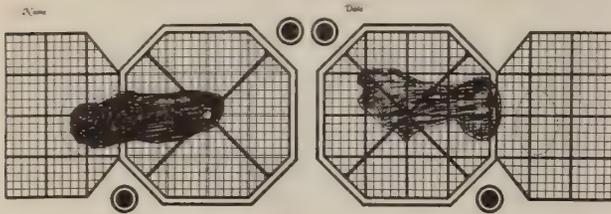


FIG. 1.—Case of old tobacco alcohol scotoma. Vision of O. S. much better than O. D. because fixing area of left eye retains its usefulness. Defect outlined is for red five mm. test object.

studies are now very important in many conditions, especially glaucoma.

It seemed to me that there was room for another instrument. The stereoscopic or binocular method appealed strongly because of steady fixation, indeed, it seemed the only way in the many important cases with impaired fixation in one eye. All kinds of central scotoma, amblyopia, exanopsia, cases of traumatic macular changes, and others, made a group of cases which any monocular method seemed not to fit. Mindful of evils of retinal fatigue (Troxler's phenomena), it seemed necessary to record the outline of the defect upon the surface of the instrument and save time and avoid weariness. The stereoscope should have a field large enough to permit blind spot studies as well as studies of the central area and it should stand upon a table and permit the patient to seat himself comfortably and eliminate all motion possible. Another idea was included to avoid retinal fatigue; the avoidance of strong contrasts and bright colors in laying out the diagram of the campimeter.

The negative fixation point of Haitz was incorporated because there is no doubt that this plan tends to encourage relaxation of accommodation and give true impressions of distance. Furthermore, the central circles were decentred outward so the image when fused is that of a large circle placed somewhat farther from the eye than the surface of the chart and a smaller circle yet farther off, but within the first circle. Thus a sort of psychic invitation to gaze into infinity is created. The degree marks are corrected for each degree as we pass from the fixation point to the periphery. It is true that the deviation from a fixed value is not great until we reach the vicinity of the blind spot, but there is no reason why we should not have accuracy when it is within reach. The location of the average blind spot is indicated upon the surface of the apparatus and the figures of Dr. H. S. Gradle of Chicago are used in locating the position and size of this standard normal field defect. His figures seem altogether the best at hand because of the excellent method used in obtaining them and the fact that his examinations were made in a larger number of cases than any other student of the blind spot.

The first efforts were made with an ordinary wide angle stereoscope and, while they were successful,

there were certain annoying features which were most appreciated when absent. To avoid color diffraction, unsteadiness, and to gain a larger field, I appealed to Mr. Max Poser for a wide angle stereoscope which would cover eleven degrees above, below, and internally, and twenty degrees externally. He responded with an instrument which was optically perfect, included correction for vertical and lateral muscular errors of the patient, and had a generous field of twenty-five degrees above and below the fixation; the usual eleven degrees internally, and thirty-five degrees externally. The instrument stood upon the table, allowing the patient and examiner to seat themselves, doing away with all motion possible. The name given to the instrument is self-explanatory, the stereoscopic campimeter slate. I am fully aware of the fact that so many instruments have been hurled at the physician that, in order to survive, it must overcome prejudice and pessimism. To speak of an instrument as "just another instrument" is usually sufficient to consign it to the limbo. For many years, oculists have endeavored to do what cannot reasonably be expected of the perimeter. This instrument has sharp and narrow limitations, and we are indebted chiefly to Dr. Luther Peter for calling attention to the fact that for years medical men have tried to do the impossible and map out central and paracentral defects on the perimeter.

There is no one instrument which will meet the demand of every case, but we ought to eliminate this ancient error. The stereoscopic campimeter slate is not adapted to work on peripheral fields. It is especially fitted for work in the central and paracentral areas, blind spots and fixation areas. As each field may be examined independently of the other

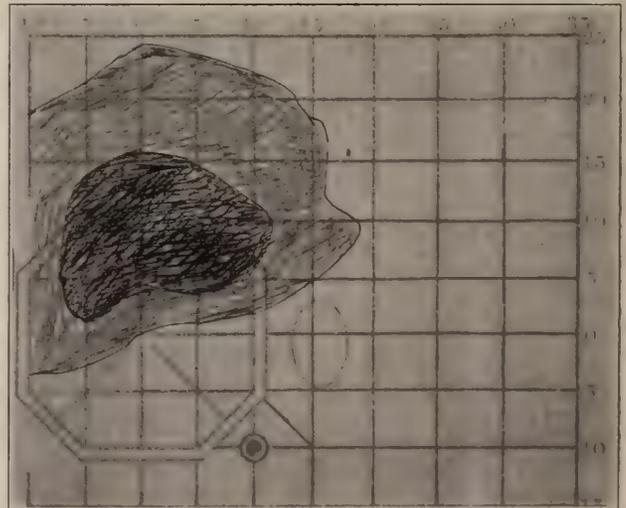


FIG. 2.—Central scotoma caused by wood alcohol. Dark central area is defect for three mm. white test object and lighter area surrounding is defect for three mm. red test object. Vision of this eye, right, 4/200. Apparently, the macular area has escaped but the fixation has been eccentric, thus accounting for the impression.

but with binocular fixation, steadiness and accuracy are evident. If one fixation area is affected, the good eye will fix and hold the one not able to fix by itself, and each field may be investigated. (Fig. 1.) The octagonal figure helps the poor eye to no small degree to cooperate with its fellow. This class of

case is probably the most common of the various kinds of field defects. A small lesion of the macular area of one eye is immediately noticed and the patient is examined by the usual methods and it is found that he cannot read 20/20 and a glass does not improve. The ophthalmoscope will not reveal

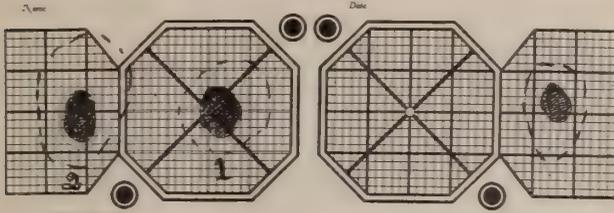


FIG. 3.—The difference between location of blind spot of 1-ft eye when the right eye fixes (marked 1), and the location of the same blind spot when the left eye fixes (marked 2) is the accurate measurement of the deviation, 15° which is about one half of the amount recorded by the perimetric method.

anything in cases in which the deeper layers of the retina, the nerve fibres or tracts or brain are involved. Are we to stop here with a diagnosis by exclusion? Too often we have done so. The lover of the concrete and absolute will deride any evidence which he cannot see himself or place his finger upon. (Fig. 2.)

We can outline these defects day after day and, if the outlines agree, we have evidence of great value. If the lesion is in the choroid or superficial layers of the retina, some will say there is no need of indirect evidence. But there are quite a number of cases of eye injuries in which the macular changes are slight, indeed—apparently negligible. But by the stereoscopic method, it is easy to show that a small central defect, even a degree, will have a serious effect upon the vision. Again, there are cases in which the diagnosis between glaucoma and optic nerve atrophy or arteriosclerosis is so close that every bit of evidence is of value. But of far greater value in glaucoma is the prognostic influence and suggestion for operative treatment in glaucoma cases, of the fingerlike scotomas which reach out from the blind spot, reaching with sinister effect upon the all important few central degrees. It would seem that too often we have felt that the vision will remain good as long as the field is of fair size. This is a delusion, for, independent of the peripheral field, to a great extent, a scotoma may develop from the blind spot and affect the macular area and, in some cases, the process may even be reversed and proceed from the macular area to the blind spot. In the early stages, these defects are relative and detectable only by small test objects and when the examination is most carefully done.

If we find our patient's poor vision is due to kidney disease or diabetes, we are likely to be satisfied without going further. It is not unusual to find a nephritic patient with white spots in both macular areas, but the vision of one eye much worse than the other. Examination will show a central scotoma in the one and not the other. Diabetic cases are similar. Acute changes in either type of case attended by edema of the retina is destructive of vision. Elderly patients often appeal to us, stating that a black spot is before one eye. If these patients are watched the usual history is that

the process goes on to marked change in the retina in the macular area with very poor vision. The blood vessels show the changes of arteriosclerosis and the finer arteries are particularly angular and tortuous. Usually the second eye becomes involved, but not infrequently the processes resulting from general vascular change abruptly end the patient's life. In the early stages, when ophthalmoscopic evidence is scant, we can obtain evidence of a relative scotoma near the fixing point. Later, ophthalmoscopic evidence may be more pronounced but the pigment migration to the superficial visible layers of the retina is not necessarily the place where the perceiving organs are affected. In other words, the lesion which produces loss of vision is not always the one which we can see. There is not always a correspondence between the objective symptom and the subjective symptom.

We are taught that scotoma is an islandlike defect in the field of vision, but if we could realize that defective vision means central scotoma and that our work was incomplete until we had investigated that scotoma, better diagnosis would result. The preceding remarks have been included to give some idea of the usefulness of the slate in field defects, but there are also other fields. Amblyopia exanopsia can be studied to advantage. Here there is one poor eye and in about ten per cent. of the cases will be found a central scotoma, small but absolute. In a larger number will be found a relative scotoma. Color vision is not to be confounded with visual acuity, though both are mainly to be found in the macular area. The patient cannot have good visual acuity and have a color scotoma, but he can have very low visual acuity and not

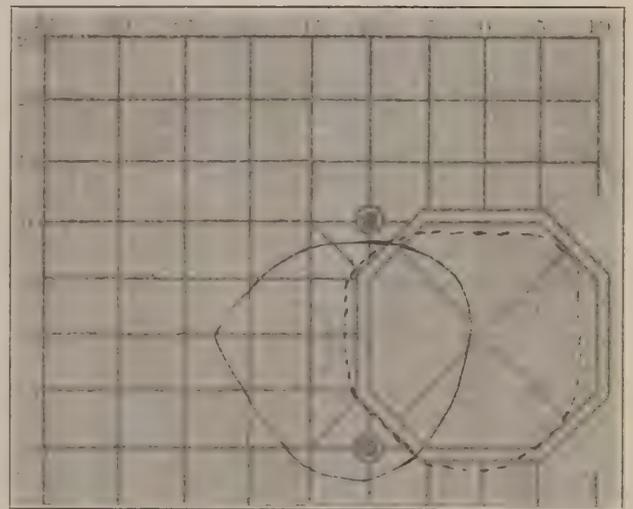


FIG. 4.—Set over obtained by Lancaster method in a case of divergent strabismus. Dotted outline is that obtained by three mm. red test object after operation and the continuous outline is the field obtained by the same test object before the operation. The perimeter registered 30° left exotropia but the campimeter slate shows about 12° and a single operation gave perfect result.

have a color scotoma. We should not forget that we are frequently using these terms one for the other. Another use of the stereoscopic campimeter slate is that of measuring deviations of squinting eyes. Sequential to this use is the proving up of the effects of muscle operations. (Fig. 3.)

For a long time the perimeter has been used to measure the degree of deviation in a case of squint. Does not the variation of the angle gamma influence our readings as much as twenty degrees? Why do some cases with thirty degrees of divergent squint seem so much harder to cure than other cases? If one will outline the blind spot of each eye in a case of squint, and also for greater accuracy, outline the field of vision of each eye for a red one millimetre test object, the patient will fix with the good eye. Then cover the good eye and have the patient fix with the poor eye and repeat the process for that eye only; the difference between the centre of the blind spot in trial one and trial two is the amount of deviation. The field for red one millimetre test object may be used as a check. Comparison with the result on the perimeter is enlightening. If one has operated in a case which has been measured as described above, the position of the deviating eye can be accurately located after the operation and the set over accurately measured (Fig. 4).

450 NINTH STREET.

A PLEA FOR PHYSICOTHERAPY.*

By JOSEPH RIVIÈRE, M. D.,
Paris, France.

The word physiotherapy, which in my opinion seems to be too extensive, too vague and ill defined, is far less suitable than physicotherapy, which is far more precise and the limits of which are much more definite. It may be that my fancy for the second word arises from its having been coined by me; but I indulge the hope that you will also appreciate, as I have done long ago, the scientific reasons which favor its adoption.

Physiotherapy (from *φύσις*, nature) simply means the natural cure, naturism, that is, the utilization, by the physician, of all the elements supplied to him by nature for the treatment of diseases.

Physicotherapy (from *φύσις*, physics) properly signifies the application to daily therapeutics of all apparatus, instruments and machines which physical science furnishes us. In other words, physiotherapy is accessible to all practitioners, whereas physicotherapy, to be practised appropriately, needs the combination of a good clinician, a learned physician and even a skilled mechanic. For the practice of physicotherapy utilizes physical science, clinicophysiological observation, and the experience gained in the handling of the countless instruments which it is likely to make use of. Without this threefold combination, nothing truly good can be obtained. The physiologist skilled in theory but lacking any clinical experience cannot be a good physicotherapist.

This failure in satisfying the proverbial condition of the right man in the right place has given insignificant curative results, and produced definite consequences disastrous to victims of the war.

The sphere of action of physical agents, how-

ever, has become so important and varied, that medical science, formerly so disdainful toward these methods, is no longer allowed to neglect the present resources of physicotherapy or to look down upon this important branch of the medical art as being menial or of an inferior quality.

When, some thirty years ago, I ventured to group under this heading of physicotherapy, in a single sanitary formation, the combined action of the various physical agents, I declared my desire of utilizing all instruments constructed according to the physical laws of gravity, heat, light, electricity and kinetics (together with vibrotherapy, atmiatry, hydriatry, etc.) adapted to the improvement or the correction of the most varied vital acts and of all our organic molecular exchanges; all in view of the perfect and normal regularization of physiological health.

I also added, that the more complete the scale of instruments made use of the more intense and decisive favorable antipathological reactions should prove to be. It is especially in the struggle against chronic diseases, which so deeply shatter the organism, that the abundance and the perfect condition of the curative instruments become attendant on our duty. If it becomes necessary to replace or at least to complete an inadequate chemicotherapy by our methods, while carefully sparing the refractory or already imperilled digestive organs, we shall obtain mild and truly beneficial reactions to correct the deviated nervous function, to hasten the peripheral circulation, to secure the required eliminations, to pick up the trophism of the tissues and to restore the humors to their normal condition.

All these methods, whether they remain isolated and specialized (as is most often the case) or whether they are collected together and combined, as I recommended in France in a debate dating thirty years back—all these curative methods belong to the province of physiotherapeutic science, an important branch of the legitimate practice of medicine, which require the diligent control of a practitioner conversant with clinical science quite as much as the pharmacological branch, and, in addition, a person well versed in physics and mechanics, straightforward, honest and disinterested according to the noble Hippocratic tradition.

In creating and vulgarizing the word physicotherapy, I was therefore working out a reasonable acceptation thereof, well defined in its determination. It by no means had to do with the utilizing of physical agents in their natural state; but it dealt with their precise domestication, in separate instruments and within a synergical group. Physiotherapy appeared to be, thirty years ago, and seems to be at present, an expression much too vague; without any paradox, the contention may be raised that the whole medical art is essentially physiotherapeutic. Do not medicines themselves form part of the domain and the province of nature? On the other hand, the physicotherapist, without despoising chemistry and its vast pharmacological vistas, takes his stand upon physical science, wherewith he controls and limits the scope of his operations rationally adapted to a method.

The progress attained by physicommechanical processes within the last quarter of a century has caused

*Read at the twenty-ninth annual meeting of the American Electrotherapeutics Association at Philadelphia, September 19, 1919.

excellent results to be obtained by our instruments, for altering the complex modalities of vital energy and the potential function of biodynamical phenomena. This is readily understood if one considers that the human body is the greatest transmuter of force and of matter. Reactional expedients are infinite, when one knows how to incorporate in a methodical manner the electrical, the thermodynamic, the hydriatic, the mechanokinetic energies duly adapted in our usual treatments. Electricity, heat, light, motion, these are the unerring causes of our physiological existence, these are the agents of our biodynamism and the equipoising principles of our nutritive economy. Chemical medication, on the other hand, has mainly disturbing effects.

A medicine acts only on the condition of its being a body foreign to the organism, of a taste generally unpleasant; it has never been in request, otherwise it would become a food without any healing effect. The fashion which prevails in pharmacological therapeutics is explained by custom. The property of transforming and utilizing ambient physical energies is increased by exercise, and such a training is highly profitable to us. When it is desired to obtain an equitable and judicious application of our treatments, it is indispensable to possess physical science and to be a practical mechanician able to supply the workmanship if required; also to appreciate the possible resources of human physiology allowing a cure to be hoped for, or, at any rate, an improvement and a change for the better in a countless number of chronic diseases which cause the despair and opprobrium of drug medication.

To repair the human motor, to unstiffen or strengthen its machinery, to stop lesions and restore the normal utilization of imperilled or disordered functions, it must be known how to administer, in a timely and adequate manner, the variable modalities of the physical cure, which is universally admitted to be the least fallacious for all functional restorations and recoveries. Physiotherapy gives the best results in diseases of the nervous system (neurosis, neuralgia, neuritis, paralysis, atony, ataxy, atrophy, tics, tremors, cramps, etc.); in nutritive slackenings and the pathological condition of sedentariness (obesity, migraine, gout, rheumatism, lithiasis, congestive state of the viscera, overworked brain, diabetes, albuminuria); in the diseases of women (pelvic congestions, metritis, fibroma, dysmenorrhœa, ovarian neuralgia); in the diseases of the senses, debility, ptosis, stricture, prostatic hypertrophy, impotency, incontinence of urine; dyspepsia and gastric dilatation; enteropathy, constitutional constipation, intestinal occlusion, cardiorespiratory disorders (asthma and emphysema, tuberculosis, arteriosclerosis, fatty heart); diseases of the blood (anemia, leucemia, various infectious toxemias); the various kinds of dermatopathy and the most malignant neoplasms. In surgery, all traumatic and trophic lesions, stiffness, impotence, atrophy, ankylosis, congenital and acquired malformations; all cases requiring the re-education of attitudes (scoliosis, deviation of the waist, growth disorders), or the mobilization of the articulations; the correction of old traumatic le-

sions and the timely resumption of a maximum useful amount of work, also fall in the sphere of physiotherapy, in its successive modalities and stages. We may add: the cicatrization of wounds and ulcers, the retrocession of certain tumors, the cure of varices and hemorrhoids. In a word, the restoration of physiological equilibrium and the maintenance for a long time of the good results achieved, are the usual rule in physiotherapy. Thanks to the perpetual improvements and to the easy doses of treatments, to the variety of the instruments and the machines employed, the practitioner may combine gentleness with energy and add to the curative precision and extent.

By regenerating the energies, by reinforcing the resistance and the means of defence of the organism, by improving cellular gymnastics, physiotherapy has revolutionized the art of healing. Thanks to the penetrating activity of the potential function infused by our various instruments, economical forces are restored, nutrition is spurred on, sleep is regained, nervous pains are allayed and circulatory disorders are regularized. Power for effort energy for work is kindled, with the joy of life and cerebrospinal equilibrium. These are all the happy results (obvious to the least attentive of observers), which have conquered for sure methods a most lasting and cheering popularity.

25, RUE DES MATHURINS.

Skin Lesions in Measles.—F. B. Mallory and E. M. Medlar (*Journal of Medical Research*, March, 1920) base this study on examinations made on 130 patients covering a period of over two years. Blood culture, smears, and the dark field illumination of fresh blood were negative for any organisms which might have an etiological relation to the disease. A study of the nasal, pharyngeal, laryngeal and conjunctival secretions also failed to reveal any significant facts about the cause of measles. The skin lesions are considered to be infectious in origin without much question, and due to the causal agent of the disease. The reasons for this belief are that the lesions are focal in character and discrete, not uniformly distributed like the rash in scarlet fever, but scattered irregularly, sometimes singly, often in smaller and larger groups, becoming confluent when sufficiently numerous. Tissue from thirty-five patients was studied, using small pieces of skin removed during life. The reaction is almost entirely on the part of the endothelial cells and leucocytes, as in certain other infectious processes. The endothelial cells lining the capillaries in the lesions have swollen, finely granular cytoplasm, which in the earliest lesions often contain one to four minute intensely staining spherical bodies, varying in size a little. These bodies are fewer in older lesions, and usually more evident at the periphery of the lesion, disappearing entirely later in the disease. It was impossible to determine the nature of these bodies, and no similar bodies have been found in the endothelial cells lining the blood vessels in other acute lesions examined as a control. The suggestion is offered that they may be the causal agent.

Editorial Notes and Comments

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NEW YORK, SATURDAY, DECEMBER 11, 1920.

THE MENACE OF TYPHUS IN EUROPE.

One of the most serious aftermaths of the war is the prevalence of the disease known as typhus fever, which is incubated and fostered by filthy conditions, for the cause, the louse, can only exist in such conditions. During the war it raged in Serbia, and is of peculiar interest to the American medical profession, because the discovery of its main means of development and dissemination was due to American investigation. At the present time the presence on a large scale of typhus in Russia and other parts of Central Europe is a distinct and growing menace to the health of the rest of Europe.

According to the report of the chief medical adviser to the British Ministry of Health, issued recently, during the past two winters almost the whole of what used to be the Russian Empire has experienced the ravages of typhus and relapsing fever in a very grave epidemic form. For Soviet Russia alone it has been stated officially that at least 1,600,000 cases of typhus were reported in 1919, while extensive and severe epidemics have occurred in the border countries of Rumania, Poland, Lithuania and Esthonia. The country of the Ukraine has also suffered most severely and conspicuously. In this connection it may be said that now refugees from Soviet Russia are crossing the Ukrainian frontier, as well as persons being repatriated, in a fearfully filthy condition, infested with lice and some of them stricken with typhus. Their disinfection and disinfection at the frontier towns are being done under American auspices, so that although the ques-

tion does not directly concern America, yet, at the same time, it is one of intimate interest. The report just referred to points out that the condition of Poland in this respect has called for special consideration on account of the geographical position of that country in relation, on the one side to Russia, and on the other to the exhausted and presumably susceptible Germanic countries, which up to now have, for the most part, escaped. Attention is drawn to the fact that in the first instance this distribution, which occurred both in 1918-19 and 1919-20, has been due to the importation of typhus infection from its permanent focus in Russia, under condition which would have put a most severe strain upon the sanitary service even of the best organized government of a settled and peaceful country.

Infection has again and again, during the past two years, been introduced in mass by the large number of prisoners of war and refugees reaching Polish territory; many actually suffering from typhus or carrying its infection. It seems practically certain that in Soviet Russia typhus will continue and increase again this winter, while in Poland further opportunities for constant introduction of infection will arise in consequence of the return to Poland, or through Poland, to other countries of large numbers of persons waiting to be repatriated, and of the influx of refugees and returning prisoners of war. Indeed, the menace of typhus to western Europe is so evident as to need little emphasis.

The outstanding question is how to prevent its gaining a foothold and devastating the population. It is fortunate that there are few diseases in which the necessary preventive measures are so well known or the principles of prevention so well established as typhus and relapsing fever. Furthermore, the experience of the war has taught that the work of disinfection can be effectively carried out by the observance of a few simple rules and with improved apparatus for the destruction of the insects and their eggs dependent on currents of steam, hot air, petrol and various other methods.

But in order to carry out measures for prevention on a large scale, as well as treatment and the observation of typhus contacts, a large quantity of raw material, a considerable and trained personnel, and a satisfactory organization of the whole of the anti-typhus work are required. In this campaign, American medical men and lay helpers have greatly assisted. There is yet much to be done, and it is to be hoped that American efforts will not be relaxed, and that Europe may be saved from the impending menace of typhus.

BLOOD TRANSFUSION IN OBSTETRICAL PRACTICE.

Direct transfusion of blood is certainly worthy of taking a foremost place among modern therapeutic measures. It is an operation that no longer presents any serious danger, and in obstetrical practice may render real service in certain circumstances. Animal experiments and the practical results in man leave no doubt of its superiority over injections of physiological salt solution in the treatment of simple hemorrhage with or without shock. Performed with Elsberg's or Bernheim's instruments the anastomosis of the vessels is rapidly and easily made, and the dangers of coagulation are avoided. Care should be taken, as far as possible, to ascertain the hemolysis of both the donor and the recipient, as well as the agglutination of the blood of each. If time is lacking to make these tests, the donor should be selected from the patient's near relatives.

In very serious puerperal hemorrhage, when the usual means of treatment by subcutaneous injections of ether, camphorated oil or caffeine, or the subcutaneous or intravenous injection of artificial serum, are insufficient to control the situation, blood transfusion should be resorted to without delay. Even if the source of the hemorrhage is not completely arrested the oozing will subside after a time on account of the increased coagulability of the blood resulting from the transfusion. This operation is also useful when the hemorrhage is combined with shock, as occurs in rupture or inversion of the uterus, as well as in premature detachment of the placenta. In ruptured tubal pregnancy transfusion will hardly ever be required, as in most cases rapid recovery will ensue by dealing directly with the source of the loss of blood. In puerperal eclampsia transfusion has given some good results, and although this question requires further study, transfusion of blood should be employed when other classical means of treatment have failed.

In serious hemorrhage in the newly born, transfusion has given unquestionably good results. Nevertheless, before resorting to it, injections of human or animal serum should be essayed. In case of failure or at the onset of the hemorrhage when unusually severe, in spite of the technical difficulties of the operation, direct transfusion of blood offers the only chance of saving the baby.

The only real accident to be feared is acute dilatation of the heart, which is due to a too large quantity or too great rapidity of the flow of blood from the donor. This accident is particularly to be feared when an organic disease of the heart exists in the recipient. Acute dilatation does not take place suddenly, and the onset is usually ushered in

by dyspnea, cough, cyanosis and precordial distress, and if the transfusion is not stopped at once, the condition of affairs will go from bad to worse. When hemolysis or agglutination of the blood occurs, it is usually when the recipient is afflicted by some serious affection of the blood.

The transmission of an infectious process must never be lost sight of, and not long since de Martel reported a case of transmission of syphilis. It was a case of transfusion from a mother to her offspring, and very shortly after the operation the baby presented a specific roseola without any primary sore.

The results obtained in hemorrhages in the newly born are so favorable that this would seem to disprove the infectious nature of these hemorrhages. It is likewise difficult to admit the vascular theory of hemorrhage in the newly born which supposes an anomaly in the structure of the capillary vessels, because the sudden change for the better following transfusion cannot be accounted for by a structural regeneration of these vessels nor to a cure of an infection. The only explanation for so rapid a recovery in these cases is some abnormal chemical condition of the blood of a congenital nature, more particularly of the serum, whose chemical makeup is not yet clearly understood.

PHYSICIAN-AUTHORS: ANTON PAVLOVITCH CHEKOV.

"The picturesque and pathetic pageant of Russian letters," writes Christian Brinton, "shows no figure comparable to Anton Pavlovitch Chekov"; and it might be added that, in recent times at least, there have been comparatively few literary figures of any other nationality that are comparable to him, especially in the field of the short story, on which his fame is primarily based. Chekov was one of the supreme masters of the short story, and even in this golden age of short story writing, his work is like manna to the reader of cultivated taste. We of America are not yet wholly familiar with the great procession of characters who march through Chekov's pages. With us, although he has been dead since 1904, he can still be regarded as a contemporary author, since new translations of him are still appearing. Thus far ten volumes of Chekov's stories have been published in English, and each succeeding volume has enhanced the author's reputation. A large section of the reading public has yet to learn that Chekov is not merely another of those gloomy Russian authors. He is much more of a genial philosopher than those compatriots of his who established in this country the grim tradition of perpetual Russian literary gloom. Like the

others, it is true, he paints the banal life of Russia, the prerevolutionary Russia that is gone, but unlike the others he has the saving grace of a sense of humor. "If his palette was gray, if the monotony of the steppe, the disillusion and disenchantment of the Russian soul covered his canvas," says one critic, "it is because they were factors in contemporary life and because Chekov always remained resolutely true to conditions around him." But Chekov's palette is not gray—that is, not solid gray. Satire and sadness, gaiety and grief, go hand in hand through his pages. His stories are full of well flavored humor. He is the true realist who sees all sides of life, and who does not forget that laughter and tears never are far apart.

Humor was a natural characteristic, an ingrained habit, with Chekov, and even life's bitterness could not turn him wholly from it. He began his writing career by contributing farcical *contes* (in 1879, under the pen name of Chekonte) to a Russian humorous paper called the *Dragon Fly*. It is true that in later years he became tinged with pessimism, but his humor simply took on a more significant form. Rollicking drollery became keen satire and subtle irony. In the English translations of his stories, the publishers have made each volume a judicious mixture of his earlier and his later work, and this disregard of chronological sequence is a happy idea, despite the inevitable violent contrasts, since it gives the reader of a single volume a more complete idea of Chekov's range and his supreme artistry within that range.

Although it is as a short story writer that we know Chekov best, he also "transgressed," as he himself puts it, in other directions. He wrote several longer stories, but they are hardly of novel length—at best they are but novelettes. These have not the charm of his shorter work, because of their lack of action and plot; but they reveal the same close observation of and insight into the human animal that marks the briefer tales. He also wrote eleven plays, five of which are serious dramas and six farces. These dramatic efforts achieved great success on the Russian stage, but they have hardly been successful elsewhere, probably because, as has been said, they are too indigenous to Russia and, like the novelettes, are too deficient in action and climax. They are said, however, to be admirable pictures of ordinary, everyday life, and are excellent reading. Five of them have been published in English.

Chekov's medical training undoubtedly was of great value to him in his literary work. Hospital scenes abound in his stories, and in nearly all there are physicians as characters. It was in the capacity of doctor that Chekov was able to familiarize him-

self with the moral frailties of the average man and woman, their banality and stupidity, their grossness of habit and lack of heart. "Chekov looks upon human nature with the charitable eye of the wise doctor who has learned from experience that people cannot be other than what they are," says Edward Garnett, the English critic. . . . "Of all modern masters of fiction, he is the most delicately responsive to the spectacle of life's ceaseless intricacy. . . . He strips the last rags of dignity from the human soul with pitiless assiduity and wanton ferocity."

Chekov was born on January 17, 1860, at Taganrog, in southern Russia. He was the son of liberated serfs and got his early education in a school at Taganrog, after which he entered the University of Moscow, where he was graduated as a physician in 1884. At the outset of his career he was pitifully poor and, to make his handicap all the greater, was afflicted with the white plague. He continued in the dual rôle of physician and writer for nearly a score of years, until at last his writings began to bring him such prosperity that he was able to retire to a villa on the Black Sea where the mild climate was favorable to his health. Even then, however, he continued to practise a little, and on the occasion of the twenty-fifth anniversary of his debut as a writer, in 1904, he said in a little autobiography which he wrote for the journal which had published many of his writings: "Medicine is my occupation, and to such a degree, in fact, that some time during the year I perform more forensic medical dissections than I once completed in two or three years." Chekov lived only a few months after this anniversary. He died of tuberculosis in the fall of that year, at Badenweiler, Germany.

LIVING BEYOND OUR MEANS.

Living beyond our means, psychologically. In lesser ways, too, accusations have been made in many directions. They will always be made until the day of wisdom comes, when psychological knowledge of ourselves is complete enough, serene enough to take ourselves for what we are. Wherever we strain on tiptoe to maintain a level not really ours, the larger background of psychological ignorance is at fault. The picture which decorates the walls is not there because it gives expression to something truly within or to some aspiration which would release that something into healthy freedom. Our clothes form the same oppressive mold, because we are trying to maintain something which is not ourselves. But much more serious is this state of things in moral attitudes and in the graver questions of life. Certain standards, ideas accepted

ready made, seem good in themselves, but there is no question if they represent inner truth—the truth of human life and individual human lives.

It was Freud chiefly who taught us how different this latter is from the external standards toward which we strain. He saw why we come away broken when the strain cannot endure. A rereading of his *Reflections on War and Death* revives for us his plea to nations as well as to individuals. We go on fooling ourselves as to our high standards, which then inexplicably collapse; our denial of death, which comes after all. He begs us to ask if we have not "again lived psychologically beyond our means."

Freud is being more and more widely accepted as the world's greatest physician, who heals because he turns his patients away from such placebos to the actual man and woman which these have sprung up to conceal. His searching reveals the weaknesses in individuals, in social institutions, in national and international character. But at least it strips away the lies that cover them. And beneath, if there is weakness, there is also the bedrock of actual material for more genuine and lasting construction.

Prostitution continues to prey upon infantile natures, while the veil of separate moral pride forbids the frank discovery of the undisciplined cravings which prostitution serves. Alcoholism is only covered over by a zealous repression which knows little of the forces it seeks to restrain. Religion, patriotism, fear to take the real measure of man, or to gage both preaching and science by man himself. Therefore, nations befuddle themselves and one another, until their need breaks out in greedy violence. Society wonders at the cankers which continue to gnaw. The individual flings himself into lawlessness or more often falls into helpless neurosis. Can medicine, politics, statesmanship, religion do better than to find out just what human means are, and educate themselves and their dependents down to them?

THE SORROWS OF TRAVEL.

The joys of travel have been much mentioned but its discomforts and dangers have been too much ignored. Even the fatigue of riding without a seat is accepted on some local lines of railway as a matter of almost daily necessity provided by Providence. There are certain features of travel that cannot be done away with until there are further developments in methods of conveyance. We refer to the noise and dirt, which in themselves are sufficient to take the joy out of railroad travel. Just why ugly sights should be added to the dirt and noise we must wonder. It would seem as if all the dwarfs and hunchback creatures in the land had been culled over for representative specimens to be exhibited in the aisles of railway coaches, and not merely presented to the eye of the traveler once,

but shown again and again, every day in the year. Now if these unfortunates could find no other employment so suitable to their capacity, or if they could be made to serve as an object lesson in public health—as a walking placard of the results of preventable disease—there might be less objection, but why a railroad coach should be turned into an objectless sideshow we are in doubt.

Railway toilets, in stations and on trains, are, as a rule, unspeakable examples of what they should not be, and are often sources of disease transmission. We have already, in these pages, gone more into detail with this unpleasant subject. But the mental wear and tear of travel is even worse than its physical discomforts, especially for the many who are not constant travelers. For most people traveling is, from the outset, a source of anxiety, and this anxiety is not always lessened by the kindness of agent, baggageman, or conductor. We know of no business in which kindness is more needed for the welfare of those in their charge. We see no reason why the hygiene of travel should be overlooked, in a day when health conditions are being developed elsewhere. If traveling can be made less wearisome, uncomfortable, and dangerous, the public deserves the benefit.

THE TOO POPULAR TREATMENT CLINIC.

In many of the clinics the child, where possible, is treated at home under supervision by the visiting nurse, or, if an ambulatory case, has to appear at the clinic during school hours. Two difficulties have arisen: many children are excluded from school dozens of times during the term for that which the mother, had she cared to note the nurse's treatment or to use it, could easily have prevented. The children also, in slight cases, enjoy being excused from school and the importance of being a patient.

What a terrible time these clinicians have! First the people will not come, then they abuse the opportunity. It has been resolved to teach the mothers and elder girls when domiciliary visits are made, and to let children attend the clinic after school hours. This latter has already had a good effect. As to payment, a small charge would cause the treatment to be valued accordingly. The overworked nurse is not supposed to replace the mother, but to teach hygiene, and the tired doctor should not have children returning again and again because the mother has been too indifferent to acquire a little knowledge.

A CORRECTION.

In Dr. Howard Fox's article on Standardized Röntgen Ray in the Treatment of Skin Diseases, which appeared in our November 27th issue, p. 837, an error occurred in the last sentence in the second paragraph of the first column. The word five should be changed to three, the sentence reading as follows:

"In cases of ringworm where short exposures were preferred the figures were as follows: six inch spark gap, three milliamperes, a minute and nineteen seconds and six and one half inch distance."

News Items.

Federal Permits to Prescribe Alcoholic Liquors.—It is reported that out of the 6,131 physicians in New York State who in 1920 had federal permits to prescribe alcoholic liquors for medicinal purposes, only 985, or less than one sixth, have applied for similar privileges in 1921.

The New Surgeon General of the Navy.—It is announced that Rear Admiral E. R. Stitt, Medical Corps, U. S. Navy, has been selected to succeed Surgeon General W. C. Braisted, who is to retire, in conformity with his own request, after more than thirty years' service in the Medical Department of the Navy.

Wellcome Prize Essay Medals.—Medals in the annual competition for prizes given by Henry Wellcome, of London, for the best essay on medico-military subjects, have been awarded to Assistant Surgeon W. C. Rucker, United States Public Health Service; Lieutenant Colonel E. B. Vedder, Colonel James L. Bevans, Captain Mahlon Ashford, and Captain Carl M. Bowman, Medical Corps, U. S. Army.

Associated Out Patient Clinics.—The annual meeting of this organization will be held at the New York Academy of Medicine, Wednesday evening, December 15th, in Du Bois Hall. The address of the evening will be delivered by Dr. W. Gilman Thompson on the Present Inadequate Dispensary Service for the Treatment of Industrial Accident Cases. All who are interested in the subject are invited to attend the meeting.

Prevalence of Venereal Diseases.—During the months of July, August, and September, 1920, there were reported to State Boards of Health 91,195 cases of venereal diseases, an increase over the preceding three months of 21,781 cases, or about thirty-one per cent. It is not considered that this indicates an increase in the prevalence of these diseases, but is a result of more complete reporting on the part of physicians.

Röntgenologists Wanted in the Public Health Service.—The United States Civil Service Commission announces examinations for the following positions in the United States Public Health Service: Röntgenologist, \$200 to \$250 a month; associate röntgenologist, \$130 to \$180 a month; assistant röntgenologist, \$90 to \$130 a month; junior röntgenologist, \$70 to \$90 a month. For full particulars regarding the requirements for eligibility, duties, etc., write to the Civil Service Commission, Washington, D. C.

James C. Farrell Memorial Hospital.—Mrs. James C. Farrell, daughter of the late Anthony N. Brady, is planning to build a million dollar hospital in Albany, as a memorial to her husband, who died about a year ago. It will be called the James C. Farrell Memorial Hospital and will take the place of St. Peter's Hospital, which is badly located and is in need of renovation. The new hospital will be erected on a large plot of ground in the Pine Hill residential section, and will be thoroughly equipped with all the most modern appliances.

Football Victims.—During the 1920 season there were eleven deaths due to football games, five more than in 1919 and one more than in 1918. Twelve lives were lost during the 1917 season, eighteen in 1916, and fifteen in 1915. The majority of deaths this year occurred among high school players, none among the big universities.

Annual Meeting of the New York Academy of Medicine.—Dr. George David Stewart was re-elected president of the New York Academy of Medicine, at the annual meeting held on November 18th. Dr. Edward L. Keyes, Jr., was elected vice-president, and Dr. D. Bryson Delavan and Dr. Seth M. Milliken were re-elected corresponding secretary and treasurer, respectively.

An Outbreak of Botulism in California.—During the month of October, 1920, there occurred in the St. Anthony's Hospital, Oakland, Cal., an outbreak of botulism. There was a total of six cases, two of which could be considered mild and four severe; of these latter, three were fatal. Unfortunately none of the cases was recognized as botulism until the third day of illness, and therefore they were not immediately reported.

Personal.—Dr. Edward J. Kempf, formerly clinical psychiatrist to the Government Hospital for the Insane, Washington, D. C., announces the opening of an office at 100 Central Park South, New York. His practice will be limited to psychopathology.

Dr. Haven Emerson, formerly health commissioner of New York city, has been appointed medical adviser and assistant director of the Bureau of War Risk Insurance.

Medical Association of the Southwest.—At the fifteenth annual meeting of this society, held in Wichita, Kan., November 22nd to 24th, Dr. Edward H. Skinner, of Kansas City, Mo., was elected president, to succeed Dr. Ernest F. Day, of Arkansas City, Kan. Other officers were elected as follows: Dr. William W. Rucks, of Oklahoma City, Dr. John T. Axtell, of Newton, Kan., and Dr. Herbert Moulton, of Fort Smith, Ark., vice-presidents; Dr. Fred H. Clark, of Oklahoma City, secretary-treasurer. The next meeting will be held in Kansas City, Mo., in October, 1921.

Brooklyn Cardiological Society.—This society, the only one of its kind in New York State, held its first meeting on Monday evening, November 29th, at the office of the president, Dr. William J. Cruikshank, 102 Fort Greene Place, Brooklyn. Other officers of the new society are: Dr. Glentworth R. Butler, vice-president; Dr. William W. Laing, secretary; Dr. Frank Bethel Cross, treasurer. The society has twelve members, all of whom are active in cardiological work, and the following honorary members: Dr. Thomas Lewis, of London; Sir James Mackenzie, of London; Dr. John Cowan, of Glasgow; Dr. Robert H. Halsey, of New York; Dr. William Thomas Ritchie, of Edinburgh, and Dr. W. S. Thayer, of Baltimore. Dr. Cruikshank made the opening address at the first meeting and other addresses were delivered by Emil Krading, Ph.D., Phil.D., the Hon. Andrew MacLean, and Mr. Henry Allan Price. The society will meet for scientific discussion every two months.

A Medical Regiment.—The new Army reorganization laws provide, it is said, for a complete medical regiment, consisting of ambulance, sanitary and hospital battalions, veterinary and administrative companies, medical supply division, and medical laboratory. All its members will be trained for the special technical services involved. Such a regiment is now being organized and will be attached to the Second Division at Camp Travis, Texas.

Infant Mortality Affected by Housing Situation.—The crowding caused by a shortage of houses has caused an increase of fifty per cent. in the infant death rate in some localities, according to the findings of the conference of health authorities held recently in Detroit for the purpose of considering housing conditions in relation to public health. It was also found that tuberculosis and other diseases were being spread by overcrowding.

Needs of the Charity Organizations Society.—At the thirty-eighth annual meeting of the Charity Organization Society, held recently, reports were made that during the last year it received \$590,450.97 and spent \$590,490.21 in its welfare work. The general work of the society caused a disbursement of \$230,218.40, while the income from special endowments amounted to \$97,183. Actual family relief was \$187,420.25 this year, against \$151,346.71 the year before. The relief budget for the coming year was set at \$190,000, while to cover all expenses the organization must raise \$511,500.

Quarantine for Venereal Diseases.—The First District Court of Appeals of California has upheld the right of a local health officer to detain and quarantine persons who are venereally infected. A woman was arrested on a charge of vagrancy. She voluntarily submitted to a physical examination, and tests were made which showed that she was infected with venereal disease. The health officer of the city and county of San Francisco ordered her detained and quarantined. Habeas corpus proceedings were instituted to secure the woman's release from quarantine, but the district court of appeals held that the health authorities had the power to isolate venereally infected persons.

Johns Hopkins Hospital to Be Remodeled.—It is reported that Johns Hopkins Hospital, Baltimore, is to be reconstructed on the most approved plan. The estimated cost of the proposed reconstruction of the hospital group, with provision for endowment, will amount to between \$11,000,000 and \$12,000,000. A new pathological building will be erected at a cost of \$600,000, to replace the old one which was burned last winter. The construction of a woman's clinic, to provide for obstetrical and gynecological patients, will be begun next year. The estimated cost is \$400,000. Other plans are:

Outpatient or dispensary building, \$1,714,000; endowment for dispensary, \$1,000,000; heating and power plant, \$100,000 to \$500,000; addition to nurse's home, \$500,000; teaching building for school of nurses, \$250,000; endowment for school of nurses, \$750,000; convalescent branch, \$250,000, endowment \$500,000; medical clinics for men and women suffering from general medical, nervous and skin diseases, \$500,000, endowment \$1,500,000; additions to service building, \$200,000.

League of Nations Discusses Typhus and Cholera in Poland.—According to cable dispatches from Geneva, the League of Nations devoted Tuesday, December 7th, to a discussion of typhus and cholera. The net results of this meeting were, first, the announcement that £200,000 only of the £2,000,000 asked for had been subscribed by the world in reply to the Council's appeal; second, it was decided that the Assembly should make a new appeal to nations and welfare societies, and, third, that the Assembly should appoint a committee of three to conduct the fight against typhus. Sir George E. Foster said that Canada withdrew the conditions attached to her offer of \$200,000. M. Hanotaux, of France, said that there were no strings to the French offer of 1,000,000 francs. A. J. Balfour said the same of England's £50,000. Wellington Koo pledged China's support. Palaccio, of Greece, said that his country would give £40,000.

Meetings of Local Medical Societies.—The following medical societies will meet in New York during the coming week:

MONDAY, December 13th.—Society of Medical Jurisprudence (annual); New York Ophthalmological Society; Yorkville Medical Society; Williamsburg Medical Society, Brooklyn.

TUESDAY, December 14th.—New York Academy of Medicine (Section in Neurology and Psychiatry); Manhattan Dermatological Society; New York Obstetrical Society; Clinical Society of the Hospital and Dispensary for Deformities and Joint Diseases.

WEDNESDAY, December 15th.—New York Academy of Medicine (Section in Genitourinary Diseases); Geriatric Society; Medicolegal Society (annual); Northwestern Medical and Surgical Society of New York (annual); Woman's Medical Association of New York City; Alumni Association of the City Hospital.

THURSDAY, December 16th.—New York Academy of Medicine (stated meeting); New York Celtic Medical Society.

FRIDAY, December 17th.—New York Academy of Medicine (Section in Orthopedic Surgery); Clinical Society of the New York Post-Graduate Medical School and Hospital (annual); New York Microscopical Society; Brooklyn Medical Society.

Died.

ABRAHAM.—In Appleton, Wis., on Monday, November 22nd, Dr. Henry W. Abraham, aged fifty-four years.

BOLEN.—In Brooklyn, N. Y., on Monday, September 20th, Dr. Nicholas Thomas Bolen, aged fifty-nine years.

BOYCE.—In Memphis, Tenn., on Friday, November 12th, Dr. James D. Boyce, aged sixty-five years.

BRECHT.—In Lebanon, Pa., on Saturday, November 27th, Dr. Samuel A. Brecht, aged sixty-one years.

CONROY.—In Everett, Mass., on Saturday, November 27th, Dr. Peter J. Conroy, aged sixty-five years.

HOGG.—In Richmond, Va., on Friday, November 19th, Dr. Moses D. Hogg, Jr., aged fifty-nine years.

HAMILTON.—In Holdenville, Okla., on Monday, November 15th, Dr. Charles M. Hamilton, aged sixty-four years.

LEIGHTON.—In New Haven, Conn., on Sunday, November 21st, Dr. Alton Winslow Leighton, aged fifty-two years.

MOORE.—In Birmingham, Ala., on Friday, November 19th, Dr. John A. Moore, aged fifty-nine years.

SHARPLES.—In Goshen, Ore., on Saturday, November 20th, Dr. Abraham Sharples, aged seventy-nine years.

SCHLITZ.—In Brooklyn, N. Y., on Friday, November 19th, Dr. Francis A. Schlitz, aged seventy-four years.

SCHUYLER.—In Utica, N. Y., on Saturday, November 20th, Dr. William J. Schuyler, aged fifty-nine years.

Book Reviews

ELECTRICITY IN MEDICINE.

Electric Ionization. A Practical Introduction to Its Use in Medicine and Surgery. By A. R. FRIEL, M. A., M. D. (Dub.), F. R. C. S. I., Aural Specialist, Ministry of Pensions, London District, etc. Illustrated. New York: William Wood & Co., 1920. Pp. ix-78.

Electrotherapy. Its Rationale and Indications. By J. CURTIS WEBB, M. A., M. B., B. C. (Cantab.), Hon. Associate of the Order of St. John of Jerusalem; Order of Merit of the Cruz Vermehla; Hon. Associate, King's College, London, etc., etc. With Six Diagrams. Philadelphia: P. Blakiston's Son & Co., 1920. Pp. 90.

Electrical Treatment. By WILFRED HARRIS, M. D., F. R. C. P., Senior Physician and Lecturer on Neurology, St. Mary's Hospital; Physician to the Hospital for Epilepsy and Paralysis, Maida Vale. Illustrated. Third Edition. New York: William Wood & Co., 1920. Pp. x-354.

Diathermy in Medical and Surgical Practice. By CLAUDE SABERTON, M. D., Hon. Radiologist to the Harrogate Infirmary and to the Royal Bath Hospital, Harrogate; Late Hon. Medical Officer to the X Ray and Electrical Department, Royal Victoria and West Hants Hospitals. With Thirty-three Illustrations. New York: Paul B. Hoeber, 1920. Pp. xii-138.

The war did much to bring the use of electricity as a therapeutic agent to the fore. In many instances the use of this important physical agent has been the most valuable at our command in the treatment of lesions caused mechanically. Healing has been hastened and function restored. A great deal that has been done during the war can be duplicated in civil practice. For this reason we feel the importance of presenting the findings of the men engaged in this field.

* * *

Vague theories and untried methods do not attract the too busy practitioner who wants sixty minutes in his hour. He will flutter the leaves of the book, and, if something novel does not catch his eye, he will put it aside until coaxed back to a reperusal by hearing it praised.

But Dr. Friel carries his credentials on the front page, and the B. E. F. certainly does mean real work, dwarfing even the M. D. He refers to Professor Leduc, of Nantes, who discovered the laws which regulate ionization, and defines that term as a form of treatment which means electrically introducing into the tissues one or other of the compounds known as salts. It also expresses the exchange of ions which takes place in the tissues following the continuous electric current.

What can it do? It promises speedy relief to a number of those complaints which are due to the inoculation of microorganisms into tissues or organs, where, owing to lowered vitality and mechanical conditions, they find a lodgment and set up irritation. It need not supersede other agencies; rather, it favors their successful use.

A clear description of what ionization really means, and the equipment necessary, leads the reader on to effects of different ions. One instance, when used in ankylosis, is worth quoting:

"An officer, early in the war, had a gunshot wound in the thigh and a compound fracture of the lower third of the femur. The fracture was excised; recovery followed, but with shortening and an ankylosed knee. He was discharged as unfit,

but he came to Professor Leduc and asked if he could be helped. The knee was treated by salicylate ionization twice a week for five weeks, each treatment lasting an hour, a current of 60, 80 or 100 ma. used. At the end of that time movement had been so restored that the minister of war had him reinstated and advanced to a captaincy, and he led his men to the attack on Chemin des Dames."

Even better are the results on cerebral affections. The bones of the skull conduct well enough to allow of action on the brain, and the brain tissue is an excellent conductor. The ionic changes, which take place between the brain cells and the fluids surrounding them, promote nutrition. That old enemy, suppuration, is dealt a deadly blow by ionization with zinc, also boils and abscesses, ulcer, ringworm, acne, pyorrhea. One's satisfaction grows with the list of diseases subdued; even eye affections are conquered.

Full details are given of the treatment for each case, but it is specially urged that the doctor should not send his patient for ionization to another doctor, losing sight of the invalid for some weeks, because, receiving him back and not knowing exactly what has been done, he is unable to go a step further and perhaps free the patient from an unhealed wound. Cooperation is becoming imperative in the medical as well as the labor world. The book is clearly written in good English and is not a heavy volume in any sense.

* * *

In reading Webb's book one is reminded that there are many doctors who send their patients to the electrotherapist because they know by results the advantages of his treatment, but cannot carry it out themselves. In the scanty leisure of a crowded life they have often picked up books giving technical details, because they honestly wanted to understand, but the inquiry was given up as one requiring too much time. Moreover, the cures wrought by an inappreciable dose or by a pretended one which were, in reality, due to psychotherapy, not electrotherapy, were puzzling and disconcerting. A case is recalled of a lady suffering from hysterical aphonia who frequently made a long journey to recover powers of speech by an electric cure, which was always successful, though the doctor declared he did not use enough to "worry a kitten."

Bearing all this in mind, Webb has confined himself to a little practical volume, nontechnical, giving the modern view as to the action on the human body of each form of electric current and how these currents may cure disease, with a list of the diseases most amenable to treatment, all of which he has treated himself. He gives a list of the larger works he has consulted in order that the readers may do the same when time is not limited.

Very carefully, never presuming anything to be known, the mysteries of currents, static electricity, radium, x rays, are simplified, and their action on the body described. Part II is devoted to general diseases, then to diseases in particular. His success in treating diseases of the nervous system and in gynecology has been encouraging, and equally so

in those commonplace bugbears, dyspepsia and constipation. Most doctors will be grateful to the author for giving them the cream of his own and other men's work and successes in one small volume.

* * *

Dr. Wilfred Harris gives us a third edition, necessitated by all that the war has taught. It might almost be imagined that the war epoch had been intended by Nature as a postgraduate school in which should be put to the test all that was new in the medical and surgical world, so many men have refurbished up their old editions, assuring us there is no doubt about their assertions because they have been converted into stern facts during the war. Harris has borne in mind that many men have only a faradic or a galvanic battery, that very few can get the use of radium, that the thorough knowledge of x ray treatment is rare, the theory of the various forms of current somewhat hazy, and has written for such, so that the wayfaring man need not err and the experienced traveler be gladdened to find old stumbling blocks cleared away.

Methods and apparatus fill the first chapter, the faradic current the second and third. Galvanism, with all its possibilities, is thoroughly worked out before the question of electric baths is dealt with or the electric light baths and x rays. Finally, a study of medical applications of sinusoidal currents, static electricity, and high frequency currents end this accumulation of garnered facts.

It will be a revelation to many to find how sure an aid electricity has been and still is in troubles small and great, from the neurasthenic with logorrhea and the woman who is "so ill as to think she is ill when she is not" to the despondent, mutilated, war spent soldier with increasing paralyses. It can soothe and banish all those everyday attacks of headache, tics, neuritis, and make all nerves approach the happy condition of the ninth one. Only those who have tested the restfulness of what is sometimes termed the fatigue couch can appreciate its consoling power.

The various diseases are not given a place in the index and only a few lines devoted to them in the text, as is the case in so many manuals. Harris has remembered that that which may seem insignificant is, to the seeking doctor, the one important thing demanding treatment by the worried radio-therapist.

* * *

Let not the amateur who doesn't think he can diathermatize but would rather like to know, think he can seriously practise without danger to patients until he has given some time and much study to it. Not everyone who possesses a dry battery may give electric treatment. First of all, high frequency currents are dealt with, then a description of the apparatus is given, and an account of physical properties and physiological effects, followed by methods of application.

Where it helps in diseases of the circulatory and nervous systems, in joint disease, in thoracic affections, forms Part II, and surgical diathermy the third. In these days, when old age finds people rebellious, not resigned, the hope given in their

misère physiologique is cheerful. Appetite, digestion, general health, are improved. The artificial, general pyrexia resulting from diathermy treatment differs from ordinary pyrexia in that it is not produced by toxins circulating in the blood. One of the evils which inexperience may bring about is an attempt to produce a raised blood pressure by means of high frequency currents in chronic auto-intoxication during constipation. An excessive absorption of enterotoxins from the intestines may be set up which will raise the blood pressure and produce an acute toxemia.

In brachial neuritis, so difficult to combat, particularly when there are trophic changes and atrophy, the author finds that diathermic application to the joints, followed by x ray treatment, often causes absorption of the periarticular adhesions. Insomnia, too, a dreaded foe, is defeated by faradization of the brain. All those diseases vaguely grouped under so-called rheumatism, especially osteoarthritis, have been much eased.

The author is quite frank about its disadvantages in surgery; the healthy structures may also be destroyed; the surgeon cannot see important vessels and nerves; secondary hemorrhage may result if operating near large blood vessels; cheloid may form when skin surfaces are involved. As exact references are given when other men are quoted, this handbook is the key to much valuable literature which will help the serious student and deter those inclined to practise with only a superficial knowledge.

HYDROTHERAPY.

An Epitome of Hydrotherapy. For Physicians, Architects, and Nurses. By SIMON BARUCH, M. D., LL. D., Consulting Physician to Knickerbocker and Montefiore Hospitals; Hydrotherapeutist to Sea View Hospital for Tuberculosis, etc. Illustrated. Philadelphia and London: W. B. Saunders Company, 1920. Pp. xi-205.

Curious, how obstinately we have fought our three benefactors, sun, air, and water. "I can't imagine how you can worship the sun," said a London lady to the Persian ambassador. "Oh, but Madam, if you could only see it," he answered. That was some years ago. Now stuffy curtains and ill lighted rooms are vanishing, bath rooms are in every house, the poisonous night air is admitted and everywhere extolled. There are still a few old people who never take a bath in case they should take cold, and some invalids, who would specially benefit, who content themselves with a foot bath for the same reason. In the largest lycée in Rheims it used to be put on the prospectus that the pupils had a footbath once a fortnight. In middle class houses the water for the children's Saturday tubbing had all to be carried from the kitchen to the nursery. At the end of each tubbing one pailful was emptied out, one of clean put in. An upstairs water supply was a luxury.

But hydro has now to carry the word therapy, and such is the charm of the unknown, many will go in for hydrotherapy who would despise the cold water cure. That it is not more appreciated and effectual Dr. Baruch ascribes to faulty instalment, conscientious but untrained directors in hospitals and sanatoria, and the ignorance of doctors concerning its theory and technic.

When in the chair of hydrotherapy at the College of Physicians and Surgeons, Columbia University, the author was able to train five hundred students without difficulty. Now he has sent out the printed word that it may be used in large institutions and in class teaching. There are special chapters on typhoid, influenza, sunstroke, tuberculosis, neurasthenia, and one on whirlpool baths, also a special one on correct instalment. Through this book hydrotherapy regains its lost status, for it is not a mere statement of what might be but a record of results gained by the author when on the staff of New York hospitals. Any mistrust of the cure now is akin to Naaman's contempt for Jordan and ours for simple fresh water as a curative agent. There is one rather odd sentence:

"In the management of chronic diseases, the espousal of the water cure by so-called empirics created bitter opposition, especially when eminent men like Sir Bulwer Lytton aided their cause by excessively lauding water in literary contributions." Here, at least, it was somewhat out of place.

A CORNER IN AMERICA.

Poor White. By SHERWOOD ANDERSON. New York: B. W. Huebsch, Inc., 1920. Pp. 371.

Too often the psychology of present day writers of fiction struggles with an oppressive self-consciousness. The unaffected telling of this tale is, therefore, strangely refreshing. It is like coming upon a fragrant, straight limbed growth of pine in a dry northern sand, after wading the dank growth of a tropical jungle. It has this simple fragrance of the earlier days in our northern central states—most of the story happens there. But into such an atmosphere creeps and hardens the merciless greed of capitalistic industrialism with its rasping worship of money power and steel made success.

The story is well told. The strokes are almost homely in their directness as this development is traced and those characters are drawn which so well typify the sons of this American age of "success." It is the true homeliness which lies close to the inner lives of the men and the few women of the book. It is not wanting even when they become encased in the mail which their greed for success has forged upon them. There is a sincerity to nature in the writing which maintains about and beneath the harshness the softness of the Ohio country, and finds its influence unmarred in certain truer souls.

Jim Priest, the farmhand, and Joe Wainworth, the harnessmaker, preserve their integrity in spite of the weakness of the former and the crazed tragedy of the latter. Chiefly does Hugh McVey, the "poor white" hero, keep his life clear from contamination. He, moreover, shows what dreams are for. He fought bravely against their slothful grip upon him, and then at last his long struggle brought him the knowledge that dreams are the background for creative achievement. So faithful was he further to the reality of dreaming that when the steel age had burned out the creative force from his inventions, he could drop a barren success and go back to the fountain of dreams for new creation. There the story leaves him.

Very often the author goes back to tell of some previous events, often rather far from the movement of his story. This is a somewhat disturbing device for providing the necessary settings for men and events. Yet even this is so straightforward, the sentences always so clearcut, that it can scarcely be complained of. The writer makes no lumbered pretense of an astute psychology. But whether only intuitively or with a specialist's knowledge he reveals many a clear gem of deep psychic fact. Is the cabbage patch chapter, for instance, one of those spontaneous revelations which writers make? The association of the crooked body, the crooked mind soured against progress, and the hunched position over the brown earth among the cabbage plants give a by no means unfamiliar psychic constellation.

Sex is handled with healthy freedom. The writer's mind is uncluttered and able to take the existence of sex in its psychic and bodily naturalness. Behind his hero's struggle into its reality, behind the various phases in which he treats the subject, the author maintains a clear understanding. One would look far to find a subtler or more genuine appreciation of its homopsychic phase than in the character of Kate Chancellor, a familiar type of woman.

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

HELPING THE RICH. A Play in Four Acts. By JAMES BAY. New York: Brentano's, 1920. Pp. 107.

CAPTAIN MACEDOINE'S DAUGHTER. By WILLIAM McFEE. Garden City, N. Y.: Doubleday, Page & Co., 1920. Pp. xxii-326.

SEX AND LIFE. By W. F. ROBIE, M. D., Superintendent of Pine Terrace, Baldwinville, Mass. Boston: Richard G. Badger, 1920.

DOMNEI. A Comedy of Woman Worship. By JAMES BRANCH CABELL. New York: Robert M. McBride & Co., 1920. Pp. viii-218.

WARFARE IN THE HUMAN BODY. Essays on Method, Malignity, Repair and Allied Subjects. By MORLEY ROBERTS. With an Introduction by Professor ARTHUR KEITH, M. D., F. R. C. S., F. R. S., etc. London: Eveleigh Nash Company, Limited, 1920. Pp. xii-286.

VORLESUNGEN ÜBER BAKTERIOLOGIE, IMMUNITÄT, SPEZIFISCHE DIAGNOSTIK UND THERAPIE DER TUBERKULOSE. Für Aerzte und Tierärzte. Von Dr. ERNEST LOWENSTEIN, a. o. Professor an der Universität Wien. Mit 1 Abbildung in Text und 2 Kurventafeln. Jena: Verlag von Gustav Fischer, 1920. Seiten viii-476.

BACKWATERS OF LETHE (Some Anesthetic Notions). By G. A. H. BARTON, M. D., Anesthetist to the Hampstead General and Royal National Orthopedic Hospitals; Formerly Anesthetist to the Throat Hospital (Golden Square), etc. With Illustrations. New York: Paul B. Hoeber, 1920. Pp. vii-151.

A MANUAL OF PRACTICAL ANATOMY. A Guide to the Dissection of the Human Body. By THOMAS WALMLEY, Professor of Anatomy in the Queen's University of Belfast. With a Preface by THOMAS H. BRYCE, M. A., M. D., Professor of Anatomy in the University of Glasgow. In Three Parts. Part I: The Upper and Lower Limbs. New York and London: Longmans, Green & Co., 1920. Pp. viii-176.

Practical Therapeutics and Preventive Medicine

A Compendium of Treatment and Prophylaxis, Original and Adapted

A Therapeutic Study of Whooping Cough.—David I. Macht (*Bulletin of the Johns Hopkins Hospital*, July, 1920) studied 115 cases of whooping cough, a few of which were in adults, but the majority were in children from a few weeks to fourteen years old. All the cases were characterized by whooping and in many vomiting and small hemorrhages accompanied the paroxysm. Most of the patients before coming to Macht had been unsuccessfully treated by paregoric and other popular drugs; some had had no treatment, while others received vaccines, with no noteworthy results. The author discontinued all medication but a twenty per cent. solution of benzyl benzoate by mouth, the doses varying from five to forty drops in water, three or four times a day or oftener, according to the age of the patient and the severity of the disease. A little benzaldehyde added to a solution of benzyl benzoate in amounts varying from one per cent. to five per cent. seemed to act more effectively than the benzyl benzoate alone. The medicine can be given in sugar water or milk where the simple alcoholic solution of benzyl benzoate is distasteful. It was not found satisfactory to give benzyl benzoate in the form of a suspension in simple elixir, in syrup of yerba santa and other syrups or elixirs. Clinically, about ninety per cent. of the patients showed more or less beneficial results, and there was marked improvement in the symptoms in about fifty per cent. The drug exerts only a palliative effect on the violence and number of whooping cough paroxysms; it is not curative.

Radium in the Treatment of Diseases of the Eye and Adnexa.—G. B. New and W. L. Benedict (*American Journal of Ophthalmology*, April, 1920) state that their experience with radium in diseases of the eye has been in two groups of cases, first, those in which, in their judgment, treatment should be with radium alone, and second, those in which the radium treatment is employed in addition to surgery. The malignant cases were selected on a basis of the character of growth, chronicity, and extent of involvement of the tissues. Various types of epithelioma may be found about the lids and globe as well as within the eye. They may be situated on the margins of the lid, at the canthus, or at the limbus. The degree of malignancy will be determined by the type of cell most abundant, and by the location and direction in which the tumor extends. A basal cell epithelioma may extend over considerable area on the surface of the lids and do less permanent damage than a much smaller, similar epithelioma at the inner canthus, which is rapidly extending toward the apex of the orbit. Epitheliomatous nests that lie deep in the tissues are difficult to reach, and for several months, or even years, after treatment with radium, it is impossible to determine whether or not the growth has become inactive. A section of tissues which had been subjected to treatment with radium years before for epithelioma, was found to be undergoing epithelial

cell proliferation and infiltration without evidence on the surface. In some cases, therefore, it is better to remove the involved tissue with the knife or cautery and apply radium later. In other cases radium alone may be sufficient to effect a cure. The action of radium in infectious diseases of the eye is comparatively slow. Rapidly extending ulcers of the cornea should be treated locally by the remedies commonly employed in addition to the use of radium, if it is used. Vernal catarrh is probably benefited by radium treatment, but a report on this disease is withheld pending further study.

The Cure of Hookworm Infection.—John L. Kantor (*American Journal of the Medical Sciences*, April, 1920) says that an individual from a hookworm district should not be pronounced hookworm free until a series of at least five negative stools has been obtained, and then only if the last treatment took place six or more weeks previously. The latent period after treatment, that is, the period in which the egg laying function of the hookworm is depressed by the vermifuge so that the persistence of worms cannot be revealed by stool examination, may extend up to six weeks. However, the great majority, ninety-eight per cent., of cases become positive again within four weeks after treatment. The usual form of treating ankylostomiasis with drugs given by mouth has been shown to be unsatisfactory, even relatively mild infections resisting as many as seven or eight treatments. Much more efficient results can be obtained by the method of intractintestinal tube treatment, owing to the fact that the full, concentrated dose of vermifuge is delivered precisely at the point of infection. Instead of thirty-four per cent. of cures, as in the case of a first mouth treatment, fully eighty per cent. are cured by a first tube treatment. Only one repetition is necessary for relief in the majority of cases.

Cardiovascular Reaction to Epinephrin.—Paul W. Clough (*Bulletin of the Johns Hopkins Hospital*, August, 1920) records his observations of a group of patients in which the cardiovascular response to epinephrin was studied in detail, because of the increasing use as a diagnostic procedure of the response of a patient to a subcutaneous injection of epinephrin. Tests were carried out on ninety-five subjects, of which thirty-two were either normal controls or patients who were regarded as physically normal. Marked differences in the cardiovascular reaction to a subcutaneous injection of one mg. of epinephrin were noted. The reactions Clough classifies as negative, moderate, marked, and very marked. A moderate reaction consisted of a rise in systolic and a fall in diastolic blood pressure, an increased, often doubled, pulse rate, and slight tachycardia. With marked reactions there was also sometimes glycosuria, and often tachycardia, palpitation, pallor, mydriasis, tremor, nervousness, and anxiety. Two factors seem to be concerned in these reactions: a direct stimulation

of the heart with increase in the force of the beat, and in the volume output, as well as in the rate, and constriction of the peripheral vessels. Atropine often exaggerated the response to a subsequent injection of epinephrin. Eighty-two per cent. of the thirty-two normal individuals gave a slight or moderate response. Patients with hypertension often showed severe reactions, which occurred irrespective of the cause, the degree, or the duration of the hypertension. None of the patients gave evidence of significant endocrine disturbance. This epinephrin sensitiveness in hypertension may be only one manifestation of a general abnormal reactivity of the cardiovascular system to stimuli, and need not be attributed to a hyperactivity of the chromaffin system or the thyroid.

Jejunocolic Fistula After Gastrojejunostomy.

—C. Bolton and W. Trotter (*British Medical Journal*, June 5, 1920) report in detail four cases of this complication and summarize the literature on the subject. Twenty-seven cases, beside their own series, are quoted. The symptoms develop after the symptoms of jejunal ulcer have existed for some time. The onset is usually with diarrhea, intestinal colic, and finally fecal vomiting. Physical examination is not of much assistance in establishing a positive diagnosis, but the x ray may help. There are various tests of feeding or of rectal injections with the examination of rectal or gastric contents shortly afterward which may help considerably in the diagnosis. Prognosis in the condition is fair if an operation is performed, as in the thirty-one cases investigated, in twenty-seven operations were performed, with twenty-one recoveries. The four cases in which no operation was performed were fatal. Realizing the possibility of this complication of gastrojejunostomy, it is highly important that we use such prophylactic methods as are at hand. The aim must be to reduce the acidity of the gastric contents by a correct diet and by the use of alkalies.

The Effect of Arteriovenous Fistula upon the Heart and Bloodvessels.—Mont R. Reid (*Bulletin of the Johns Hopkins Hospital*, February, 1920) gives abstracts of experiments on twelve dogs in which fistulae were produced, in the femoral vessels in five instances, and in the remaining seven between the internal carotid artery and the jugular vein. Abstracts are also given of fourteen cases of arteriovenous fistula treated in the wards of Johns Hopkins Hospital. From this clinical observation and experimental study Reid concludes that an arteriovenous fistula of long standing usually causes dilatation of the artery proximal to the fistula, which dilatation may extend as far as the heart. An acquired arteriovenous fistula of long duration may produce cardiac hypertrophy and dilatation with eventual decompensation. The wall of the vein involved in an arteriovenous fistula becomes hypertrophied, and though the vein on the proximal side of the fistula does not increase greatly in size, its wall does show a greater increase of elastic tissue than the wall of the vein distal to the fistula. There is an increase in the venous blood pressure in the part of the body distal to an arteriovenous fistula, which returns to normal when the fistula is cured.

Treatment of Industrial and Traumatic Deformities.—Walter G. Stern (*Ohio State Medical Journal*, May, 1920), in discussing the treatment of these conditions, concludes that infection must be avoided at all costs by thorough asepsis, the avoidance of needless operations, and perfect fixation during the stage of first aid. Fractures must be thoroughly reduced and accurately fixed in appropriate positions. All fractures should be radiographed for study and record. After the danger of infection has passed corrective operations can be safely performed. Closed fractures are not to be unnecessarily opened up. End to end apposition is not always the best method to obtain a good functional result. Hydrotherapy, electrotherapy, mechanotherapy, massage, and active and passive exercises should be employed.

Treatment of Diphtheria.—Aurelio Ramos (*La Medicina Ibera*, June 5, 1920) divides the treatment into specific, local and general. As to specific treatment he emphasizes the importance of the administration of a sufficient dose of serum at the outset, preferably by the intravenous route, and he does not repeat the dose until the second or third day. He disregards the dangers of anaphylaxis as being very rare. Locally he has had the greatest success with Dakin's solution and pyocyanase which is an enzyme obtained from cultures of the pyocyanus bacillus. This enzyme was found by Emmerich and Loew to inhibit the growth of the diphtheria bacillus and to fix its toxins, at the same time dissolving the membrane. General treatment consists of rest in bed with attention to tachycardia, high temperature, and albuminuria.

Intermittent Hydrops of the Parotid Due to Artificial Dentures.—Jardet (*Bulletin de l'Académie de médecine*, April 13, 1920) observed in four healthy persons a sudden painful but temporary swelling of the parotid gland, which he ascribes to the wearing of new artificial dentures. The condition generally appeared within a few days after initial use of the dentures, and set in suddenly, as a rule at breakfast time. The gland enlarged rapidly during mastication, and soon reached the size of a mandarin or even an orange. The initial sharp pain passed into a dull pain, suggesting mumps. The gland gradually subsided in the afternoon, but the swelling recurred on the next day. Suppression or modification of the denture was always followed by recovery in two or three days. Where the denture was not removed, the acute manifestations subsided after four or five days, but recurrence took place frequently within three or four weeks, continuing in one case as long as eighteen months. In such instances the gland showed slight induration and sometimes slight enlargement in the intervals between attacks. In each of the author's cases the prosthetic apparatus used was a plate of hard rubber bearing upper molars on the affected side and with a markedly prominent outer border, impinging on the tissues between the gums and cheek with each movement of mastication. Abrasions of the mucous membrane in this situation were noted. In no case was a gold plate in use; such plates are considered to have antiseptic properties and are lighter than the hard rubber plates.

Proceedings of National and Local Societies

NEW YORK NEUROLOGICAL SOCIETY.

Regular Meeting, Held April 20, 1920.

The President, DR. WALTER TIMME, in the Chair.

(Concluded from page 920.)

Acute Descending Radiculitis—A Spinal Type of Epidemic Encephalitis.—DR. IRVING H. PARDEE in this paper offered a survey of the literature on the subject, notably in its connection with herpes zoster and syphilis. During the influenza epidemic he had had occasion to study a number of cases of radiculitis all of which invaded the cord in a descending fashion, and presented characteristic symptoms of sharp lancinating root pains, paresthesia, muscular spasms, hyperesthesia, delirium, and fever. Several days after the onset of the pains, involuntary muscular spasms appeared, causing coarse twitching movements of head, shoulder and neck, like the spasmodic contractions sometimes observed in spinal cord tumors. About a week later when the symptoms had become much less severe a mild delirium usually appeared. A confusional state persisting for three or four days was noted, followed by a two week period of dulness and general apathy.

The clinical course of the disease was peculiar. The symptoms were at first confined to the arm and neck, then progressed downward in orderly fashion. Radiating pain was first felt in the upper chest, then girdle sensations around the waist. While the symptoms were at their height in the intercostal and abdominal region there was delirium, but the pain was usually less severe. The symptoms then descended to the legs, the pain increasing greatly in intensity. A slight increase in fever preceded the invasion in the lumbosacral region, which diminished again in about four or five days. Thereafter a slow convalescence of many weeks' duration began. During this convalescence there was a coarse tremor of the arms and legs. No other vasomotor, trophic, or sensory changes were to be noted. There was no anesthesia to touch, pain or temperature, no disturbance of deep sensibility, and no herpes. The reflexes were not profoundly altered, though at the onset slight exaggeration of the deep reflexes was noted with a diminution in their activity several days after the invasion in each region. There was no alteration in pupillary reaction, no blurring of vision, nor oculomotor weakness. Control of the bladder and rectum was retained. One symptom of interest observed in all the cases was an involuntary flexion of the head. It was not necessary for comfort, and resembled the attitude seen in cervical spinal cord tumor, syringomyelia, and sometimes in amyotrophic lateral sclerosis. The results of laboratory analysis showed a leucocytosis in the blood—and in the spinal fluid an increase in globulin and a pleocytosis.

Dr. Pardee gave the history of one case that presented all the characteristics outlined. Clinical evidence from this and numerous other cases studied showed that there was frequently an involvement of the posterior spinal roots, appearing either

alone or in conjunction with signs of an encephalitis. All Dr. Pardee's patients recovered, so other reports had to be resorted to for autopsy findings. Round cell infiltration in the posterior root ganglia was noted by Strauss and Loewe, and a like involvement with some small hemorrhages and perivascular infiltration by Flexner and Amoss.

In summarizing the points brought out by his study, Dr. Pardee stressed the frequency with which epidemic encephalitis might invade almost any portion of the nervous system. It seemed to show a predilection for the basal ganglia, nuclei of cranial nerves, and posterior roots, as evidenced in the cases that he studied. Acute descending radiculitis was an infection of the posterior spinal roots which might appear as a separate clinical entity and pursued a stereotyped course, ending in recovery. It might also antecede in a more or less typical but usually attenuated course, the cerebral form of epidemic encephalitis. If a posterior root syndrome might be considered a prominent complication of epidemic encephalitis, Dr. Pardee believed that myoclonic twitchings, hyperesthesia, and radicular pains might be considered as much a part of the picture of the disease as diplopia, somnolence, and cranial nerve palsies. The concomitance of radicular pains and influenza offered another suggestion on the obscure etiology of this disease manifestation.

An Analysis of the Cases Admitted to the Neuropsychiatric Services of the U. S. A. General Hospital Number 1.—DR. SYLVESTER R. LEAHY, of Brooklyn, described the opening of the ward for neuropsychiatric patients from overseas and such cases as developed in hospitals under the jurisdiction of the Port of New York. The hospital was opened on November 22, 1918, in the former Messiah Home. It contained five wards, two of which were devoted to the psychoses, one for disturbed patients, and one for quiet depressed ones. The remaining space was allotted to mild mental states, epilepsies, psychoneurotics, constitutional psychopaths. The bed capacity was 220. During the time that the hospital was in operation, nine months and twenty-two days, 2,750 patients were admitted, 2,126 patients came from overseas, and 624 were local cases. Since the hospital was an evacuation unit, urgent conditions only were treated, but its facilities were very complete, and detailed reports and recommendations for treatment were forwarded to each patient's final destination.

Of the total number of cases, twenty-four per cent. were psychoneurotics, twenty per cent. were of the dementia præcox type, twelve per cent. were of the manic depressive group, ten per cent. were mental defectives, five per cent. were organic nervous disease, principally of the syphilitic type, four per cent. were definitely epileptic, and four per cent. were constitutional psychopaths. Doctor Leahy made a comparison between the group percentages of the hospital with the group percentages of the New York State Hospital service male admissions; twenty per cent. army and twenty-seven per cent. civilian was the result for dementia præ-

cox, and twelve per cent. army and nine per cent. civilian for manic depressive psychoses. The dementia præcox was predominant in both groups. A certain number of psychoses were left ungrouped because of lack of data sufficient to make a differentiation possible. Some of the patients refused to answer questions. They appeared confused and in a dreamlike perplexed state. At times they were very depressed.

Dr. Sanger Brown, II, in discussing this paper offered some statistics regarding the Hospital Centre at Savenay, France. From this centre nearly all the disabled of the A. E. F. were returned to America and it was at this point that neuropsychiatric cases were evacuated. The census of the centre was about ten thousand patients, and of this number about one thousand were in the neuropsychiatric service; in other words, one tenth of the cases. From a survey of all cases in the centre made later, it was found that about twelve per cent. of all the injuries involved the central or peripheral nervous system; and it was thought that in the general wards were other patients suffering from neurotic symptoms of sufficient number to bring the total percentage of cases coming under the care of the neuropsychiatrists to about thirty in that centre.

Of the patients returned to the United States from the neuropsychiatric service about thirty per cent. were suffering from psychoses, thirty-three per cent. suffered from psychoneuroses, ten per cent. were mental defectives, eight per cent. were epileptics, ten per cent. were psychopaths, and five per cent. suffered from organic diseases with mental manifestations; the remaining four per cent. were undetermined types.

The staff was conservative in rendering a positive diagnosis of dementia præcox since the symptoms were acute and the unusual circumstances were taken into consideration. A number of mental conditions were encountered, with which the staff was not familiar in civil life—the so-called war psychoses, physical exhaustion, delirium, and fear, with disorientation, were especially common. A second unusual condition was the combination of hysterical states, such as palsies, contractures or tremors with a psychosis, or with epilepsy or mental defect. Lethargic encephalitis, new at that time, was encountered to a considerable extent, and as no literature was available, these cases were very puzzling when they first began to appear.

A Study of Pubertas Præcox.—Dr. J. H. LEINER reviewed the historical references to cases of pubertas præcox. In this syndrome it would seem that the child passed through several stages of life *in utero*. The endocrines seemed to be a primary factor in the causation of this condition. Secondary factors were climate, race, and heredity. As was well known, menstruation appeared normally at a somewhat earlier age among women in southern countries, while the inhabitants of the north normally did not begin to menstruate until from fourteen to sixteen. Marriage in Oriental races took place very early, and the precocity of the southern races might be due to this inbreeding.

Doctor Leiner described two cases in which there had apparently been direct hereditary transmission.

One subject, a girl, at birth gave the impression of a twelve year old child; menstruation began at six weeks, and was regular thereafter. A second case, that of a boy, at four years of age looked as though he were at least ten, and had the physical development of a young man of twenty-one. The parents in both cases reported marked virility, or there was actual pubertas præcox in the parent.

Precocious puberty is caused by a hypersecretion of either the gonads, pineal, or corticoadrenal glands. A secondary involvement of the pituitary and thyroid is also unquestionable. Clinicopathological evidence showed that the first three glands were involved in this syndrome, either in the form of hyperplasia affecting them, or neoplasms.

Rogers collected 101 cases of pubertas præcox, eighty-one in the female and twenty in the male; out of the eighty-one cases in the female, seventy-three pointed to the hyperovarian type. Other writers had recorded cases of this type, among them Lenz, who described the case of a girl in whom menstruation began at sixteen weeks. The secondary sex characteristics were those of a mature woman. As she grew up she became a good scholar, but preferred the society of children of her own age. At twelve she was very shy and childish in behavior.

Lucas reported neoplasm of the ovary as a cause of pubertas præcox. At seven his patient showed all the signs of genitosomatic maturity, with early menses. After removal of a tumor of the ovary, all signs of adolescence, and menstruation, disappeared. Eleven cases of sexual precocity associated with ovarian neoplasms were collected by Roger Williams. This did not necessarily indicate that tumors of the ovary lead to sexual precocity, since other factors entered into the causation. The mentality in the ovarian cases never seemed to be very great; in fact, the patients spoke and acted their true age. Early menstruation in hyperovarianism produced excess calcium elimination, which resulted in short stature.

In the corticoadrenal types of cases the clinical picture differed according to whether the involvement was in the male or the female. Hyperplasia of the adrenals in the male tended to accentuate male precocity; in the female, the tendency was to change the female into the male type with all the secondary sexual characteristics of the male. The mentality in these cases was low.

In cases of hypergonadal condition in the male, mentality was usually retarded. In one case of precocious sexuality the removal of a malignant tumor of the testicle caused the disappearance of the adult characteristics. Tumors of the pineal and their effect upon sexual precocity had been extensively studied, but as yet no direct connection seemed to have been demonstrated, aside from the statistical fact that pineal tumors occurred predominantly in the male while those of the adrenals were most frequent in the female. There was little or no real mental precocity in all these types, the patients were usually shy and reserved on account of their appreciation of their differences from the normal type. Early diagnosis in the hyperplastic types might result in improvement by proper endocrine therapy.

Meeting Held on May 4, 1920.

Presentation of a Case of Epileptic Seizures, Transient Hemiplegias, and Temporary Papilledema of Doubtful Etiology.—Dr. THOMAS K. DAVIS showed a patient who had had typical epileptic seizures since her eleventh year. There was usually temporary weakness of the right side after an attack. She was brought to Bellevue after an especially severe attack, where her condition was diagnosed as a straight case of epilepsy. On the tenth day, however, she awoke with a severe hemiplegic condition on the right side with a partial motor aphasia. The fundi were considered normal on the day that the hemiplegic symptoms developed, but forty-eight hours afterward a papilledema was found on the right and a blurring of the disc on the left. The papilledema did not continue, so the theory of a neoplasm with a hemorrhage into it had to be abandoned. A month after the onset of the hemiplegia the patient had recovered the motor function of the right side, and was able to walk without support.

In reviewing the possible causes for this papilledema, ethmoid sinus infection was ruled out by absence of fever and by negative findings of the nose and throat. No edema or other signs of acute nephritis had been observed in the patient and the high tension cardiac changes were also lacking. Epidemic encephalitis did not seem probable, since there was no somnolence, no ocular palsies occurred, and the patient had no fever. Finally, Dr. Davis called attention to the glandular makeup of the patient, pigmentation and evidence of suprarenal deficiency, with gonadal deficiencies also, and suggested a possible etiology in focal compensatory changes in the pituitary gland causing temporary pressure on the third ventricle with resultant swelling of the optic nerve heads.

An Unusual Case of Epidemic Encephalomyelitis.—Dr. WALTER M. KARUS presented the case of a riveter, aged thirty-two, who was admitted to Bellevue Hospital on February 23, 1920, complaining of pains and weakness in the shoulders and arms. These pains he had had in the shoulders and arms for three to four weeks prior to admission. They were increased by movement. Soon after the onset, weakness of the upper extremities became noticeable and finally compelled the patient to stop work on February 10th. He noticed diplopia one week before admission.

On admission there was weakness and tenderness of the muscles of both arms from the deltoids down. There were fibrillary twitchings (paralysis of the long respiratory nerve of Bell to the serratus magnus). Some winging of the left scapula was also present. The weakness was generally greater on the right than on the left. This may have been due to the fact that for twenty years the patient had been accustomed to carry heavy pieces of iron on the right shoulder. The pectoral muscles were strong. There was a slight weakness of the muscles supplied by the left seventh cranial nerve, and a masklike expression. There were nystagmoid movements of both eyes to right and left. Tremor of the eyelids, tongue and hands was present. The triceps jerks were absent; supinator jerks present;

other reflexes normal; no sensory changes beyond the pain noted, and no incoordination. On April 26th the diplopia was still present; March 1st, sleepiness very marked and hard to control; March 4th, atrophy and tenderness of both infraspinati noted; W.B.C. 10,400, polymorphonuclears sixty per cent.; March 13th, tenderness in the shoulders had gradually disappeared and there was tenderness in the hands; March 17th, pill rolling type of tremor noticed in both hands; March 18th, gait was shuffling, conjugate movement of both eyes downward poorly done. Laboratory findings showed the spinal fluid, on admission, forty cells; globulin, colloidal gold 0000121000, Wassermann negative. There existed slight left facial weakness; complete paralysis of the right serratus magnus and partial paralysis of the left serratus magnus (winging); electrical reaction, complete R.D. in the right serratus magnus. All the other muscles of both arms, forearms and hands showed a partial R.D. There were fibrillary tremors, atrophy and weakness of all the muscles of both upper and lower extremities. In brief, a case of acute epidemic encephalomyelitis showing among other signs the results of involvement of the anterior horn cells of the lower cervical (5, 6, 7, 8) and first thoracic spinal segments.

Myotonia Accusata.—Dr. I. ABRAHAMSON presented a patient who had been shown two years before by him as an interesting example of myotonia accusata. The condition was of six years' duration, no illness preceded the onset, the patient was simply unable to move as quickly as before, and found that he could not swallow. The initial movement was always difficult, and at the present time this was one of the few symptoms retained. The patient could clench his fist, but an additional effort was required to unclench it. The Erb sign still continued. When the tongue was pressed a distinct ridge lasting for several seconds could be evinced. The treatment had been three fourths grain of thyroid daily, and forty-five grains of calcium lactate. Under this treatment the patient had recovered from his clumsiness and was able to work.

Doctor Abrahamson called attention to the fact that the left sternomastoid was beginning to waste, and remarked that certain myotonias of Thomsen merge into myotonia atrophica.

The Motofacient and Nonmotofacient Cycles in Elevation of the Humerus.—Dr. BYRON STOOKEY read a paper in which the results of his investigations on the muscles which act in the elevation of the humerus were set forth. Heretofore it had been generally accepted that the deltoid raised the arm approximately to a right angle and the elevation was completed by scapular rotation. His study made by means of radiographic plates proved that the deltoid without rotation of the scapula was unable to raise the humerus beyond 60°. From this height to about 115° scapular rotation was called into play, and finally the elevation from 115° to an approximate straight angle was completed by the deltoid. The deltoid accordingly acted first as abductor, then after the scapular rotation had raised the arm over the intervening 55° from 60° to 115°, the deltoid acted as abductor for the rest of the distance.

The elevation of the humerus was accordingly effected by alternating cycles. In the first cycle the deltoid and supraspinatus were motofacient while the scapular muscles were nonmotofacient. In the second cycle it was the scapular muscles that were motofacient, while the deltoid, supraspinatus teres major, pectoralis major and latissimus dorsi were nonmotofacient. The completing cycle again called into play the deltoid and supraspinatus. Supplementary factors, hitherto ignored, that played an important part in this last stage of elevation, were two muscles, the clavicular head of the pectoralis major, and the coracobrachialis. These muscles participated in elevation especially when great force was required, or when there was impairment of the normal function of the deltoid.

Medical and Social Problems of Childhood Delinquency.—Dr. SANGER BROWN, II, in reviewing the question of the medical and social aspects of childhood delinquency, spoke of a survey which was being made in one of the probationary schools in New York city, under the auspices of the National Committee for Mental Hygiene, and upon the invitation of the public school authorities. This survey consisted of a thorough physical examination of the child, a mental examination, psychological test, and a social survey of his home and environment. To carry on this work a physician, a psychologist and a social service worker had been appointed. In their inquiry as to the causes of delinquency, an attempt had been made to determine to what extent this condition arose from physical causes, mental defect, inherent personality, disorder, and environmental influences. In describing the cases so far examined, certain groups of children were found. There were the nervous children, not designated as neurotic in the way adults are generally described, but children who showed increased motor activity, decreased motor activity, lack of emotional control, such as explosive, irritable or sensitive states, and disorders of sleep. These nervous symptoms were considered benign in character and amenable to treatment. The causes were considered both physical and mental. In the physical, they might be malnutrition, overstimulation from unsuitable food and physical exhaustion. In the mental sphere a child might become neurotic and emotional for many reasons. A child was particularly sensitive to faulty home influences—a nervous mother, friction between parents, all of which caused social misunderstanding. The child might be unfavorably compared with another in the family and might feel a sense of failure or inferiority. Such maladjustments might, of course, arise in school and they might arise from sources within the child itself—from his instinctive life. Nervous children became delinquent because they could not conform to the ordinary school discipline. Reasons for their irritability and emotional state were not understood, and when they were disciplined they did not improve and were likely to become truant. They associated with bad companions, and delinquency was engrafted upon a nervous state.

Doctor Brown did not consider mental deficiency as important a factor in childhood delinquency as had been often stated. The real problem of delin-

quency was not one primarily of mental defect, but was one of maladjustment. About twenty per cent. of this particular group were mentally defective, and with them the delinquency was a secondary feature.

The question of personality and delinquency was considered by Doctor Brown. Although in the adult delinquent one felt that the personality was primarily at fault, one did not seem warranted in assuming that delinquent children had any special personality disorders or tendencies toward delinquency because of inherent mental traits. So many causative factors were found in their environment or in their physical condition that one did not seem justified in considering the symptoms which they showed as inherent. One did find in delinquent children many with special aptitudes and interests who did not get along well in the regular classes, and also children of rather dull intellect who did not like school; but they were delinquent secondarily, and not because of their mental traits. If, however, ill conduct continued over a period of some years there was reason to believe that these traits of character became established and were very difficult to eradicate in the adult.

In the management of childhood delinquency, the need of individual study as to the needs of each case was urged from a physical, mental and social viewpoint. The social attitude of the community toward delinquency was, as a rule, an unfavorable setting for the child because he received unfavorable judgment before his case was thoroughly understood. Doubtless the main way of dealing with delinquency was by preventive treatment, and much could be accomplished by separate classes for children with special aptitudes, neurotic symptoms, and for those who could not do the regular class work for any reason. This would tend to improve the delinquency which eventually developed in these cases, and there was reason to believe that it would also prevent considerable adult delinquency, since maladjusted children tended to drift to permanent conduct disorders unless corrected.

An Emotional Crisis.—Dr. EDITH R. SPAULDING told of the opening of the Psychopathic Hospital of the Laboratory of Social Hygiene at Bedford Hills. The attempt had been made to treat the patients as though they were in a psychopathic hospital that had no connection with a reformatory institution. Sources of irritation were removed and the patients were helped to make the necessary adjustments to make it possible for them to live in a social group. The various known methods of treatment and training were installed. None of the punitive measures usually practised in reformatories were used unless it was necessary to segregate an individual patient who would disturb the equilibrium of the group. The final solution, Doctor Spaulding stated, of this very intricate problem, would never be found in therapy alone, in educational or in self-government alone, or in discipline alone, but in the utilization of all these resources by those who had made a close study of the problem. It was urged that all neurologists and psychiatrists contribute their findings in an effort to solve this, one of the most difficult of all social problems.

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AN UNUSUAL CASE OF ALKALOSIS AND IMPAIRMENT OF THE EXCRETORY POWER OF THE KIDNEYS.

By JOHN LOVETT MORSE, A. M., M. D.,
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Professor of Pediatrics, Harvard Medical School.

Clara G. was admitted to the Children's Hospital May 3, 1920, when ten and a half years old. Her parents and two other children were alive and well. There had been no deaths or miscarriages. There was no tuberculosis in the family and there had been no known exposure to it.

She was born at full term after a normal delivery, was normal at birth, and weighed eight and three quarter pounds. She was nursed for eighteen months, but took cereals also at nine months. She had had what was called meningitis at two years, whooping cough at four years, diphtheria at five years, measles at six years and chickenpox at nine years. She had never been very strong. She had wet the bed since she was two years old, having stopped previously. Her urine had been examined in 1916 and the slightest possible trace of albumin and "quite a large amount of pus" found. It is presumable that the pyelitis had persisted since that time. She was said to drink much water and to pass large amounts of urine. She had had pain in her feet for three months and in her knees for a week.

Physical examination.—She was poorly developed and nourished. Her complexion was pale and sallow. Her teeth were poorly cared for and there were several cavities and old roots. There was very little tonsillar tissue. Her tongue was coated and her breath was foul. D'Espine's sign was absent. There was a slight systolic murmur at the base of the heart and a venous hum in the neck. The heart was otherwise normal. The lungs were normal. The abdomen was somewhat sunken. The liver, spleen and kidneys were not palpable. There was no tenderness in the region of the kidneys. The external genitals showed nothing abnormal. The extremities were normal. There was no spasm or paralysis. The knee jerks were equal and rather active. There was no clonus. Babinski's and Kernig's signs were absent. There was no edema or enlargement of the peripheral lymph nodes.

The examination of the blood showed: Hemoglobin (Tallqvist), sixty to sixty-five per cent., red cells, 2,932,000, white cells, 5,300, small mononu-

clears, thirty-two per cent., large mononuclears and transitionals, three per cent., polynuclear neutrophils, sixty-four per cent., and mast cells, one per cent. The red cells showed slight variation in size, but none in shape. There was very little achromia. No nucleated cells were seen. The blood platelets were apparently somewhat decreased.

The urine was pale, very cloudy, slightly acid in reaction and of a specific gravity of 1005. It showed a slight trace of albumin, but no sugar, acetone or diacetic acid. There were five mm. of sediment after centrifugalization. This contained a great many pus cells, singly and in clumps, and a few small, round cells, but no red cells or casts. It also contained many motile bacilli. The tuberculin test was negative.

She was started at once on thirty grains of bicarbonate of soda every four hours. On the morning of May 5th the dose was increased to sixty grains every four hours. That afternoon her hands and fingers began to be stiff and in the evening were in the typical position of tetany. The next morning her legs and feet also assumed the position of tetany. There was a marked facial phenomenon on both sides. At that time she had had two hundred and seventy grains of bicarbonate of soda and the urine was alkaline in reaction for the first time. The diagnosis of spasmophilia was made, but the importance and the possible gravity of the condition were not appreciated and the bicarbonate of soda was continued. She was drowsy that day, was very thirsty and passed much urine.

Edema of the face appeared the morning of May 7th. The signs of tetany continued. There were also attacks of slight spasm of the larynx. The urine contained the slightest possible trace of acetone but no diacetic acid. The carbon dioxide tension of the alveolar air was forty-five. During the morning she began to vomit continuously.

She began to have convulsions the morning of May 8th and soon became unconscious. The cerebrospinal fluid obtained by lumbar puncture was clear and under normal pressure. It contained two cells to the cubic millimetre. There was no globulin present and Fehling's solution was reduced. The fundi showed no signs of increased cerebral pressure. The bicarbonate of soda was then stopped, after she had had a total of 750 grains in five days.

The diagnosis of spasmophilia was made and it seemed reasonable to suppose that it was due to the bicarbonate of soda which had been given for the

pyelitis. It was difficult, however, to understand why the bicarbonate of soda had brought on the spasmophilia, because doses of this size are given very frequently in the treatment of pyelitis with no untoward results. A plausible explanation seemed to be that offered by Dr. Aub, that the sodium had driven out the calcium and that on account of the disturbance of the normal balance between sodium and potassium on the one side and calcium and magnesium on the other side, the spasmophilia had developed. Dr. Aub tested the alkali reserve of the blood and found it to be thirty-one volumes per cent. carbon dioxide for one c. c. of plasma, that is, diminished. It is very difficult to understand this finding, because it would seem as if the alkali reserve could not be reduced under the circumstances. It is possible, but not probable, that there was an error in the observation. It is more reasonable to suppose that the observation was correct and that we are unable to interpret it because of lack of knowledge.

Under active treatment with glucose and water by mouth and by rectum and with water subcutaneously, she gradually improved and by the end of a week all signs of spasmophilia were gone and she was in good condition. The urine still showed evidences of pyelitis.

As the urine continued to show all the signs of pyelitis, on June 3rd she was started on fifteen grains of urotropin and twenty grains of acid sodium phosphate three times a day. As the urine was not very acid and Burnham's test was negative, the acid sodium phosphate was increased June 9th to twenty grains every four hours. The next morning she complained of being tired, went to bed and was more or less drowsy all day. In the afternoon she complained of headache and began to vomit. The facial phenomenon and peroneal reflexes were present. She was very thirsty and edema of the face developed.

The carbon dioxide tension of the alveolar air was between ten and fifteen on June 10th and again on June 12th. The urine, however, did not contain either acetone or diacetic acid. Here again it is difficult to explain the low carbon dioxide tension, when the spasmophilia was presumably due to the intake of sodium. It is probable that there may have been some error in the observations, as when there is an error in estimating the carbon dioxide tension in the alveolar air, the mistake is always in getting it too low. It is possible, however, that the estimations may have been correct and that the low tension was due to some action of the acid portion of the acid sodium phosphate on the blood. The acid sodium phosphate and urotropin were stopped the next morning. She had had during the week 660 grains of acid sodium phosphate, which is equivalent to 110 grains of sodium by weight. The evidences of spasmophilia began to diminish as soon as the drugs were stopped and on June 14th she was well again. The carbon dioxide tension had then risen to between fifteen and twenty.

Dr. Lewis W. Hill then called attention to the fact that the specific gravity of the urine had been extremely low from the beginning, running 1005, 9, 8, 8, 10, 7, 8, 5, 6, 5, 4, 6, 4, 4, 2, 1, 4, 1, 4,

4, 4, 5, 2, 5, 3, 0, 3, 2, 3. He suggested that the trouble might be that the kidneys were unable to eliminate salts and that that was the explanation of the retention of the sodium and the development of the spasmophilia. The patient was then studied with this idea in mind. The investigations which were made from June 15th to 21st gave the following results: Phthalein test, first hour, seventy-five c. c., no color, second hour, seventy c. c., less than five per cent. The gravity fixation test which was done by giving the child three meals of practically the usual house diet to which two grains of caffeine sodium benzoate and fifteen grains of sodium chloride were added at each meal, the fluid being limited to ten ounces at each meal, with nothing between meals, showed:

6:00 a. m.	220 c. c.	1004
8:00 a. m.	125 c. c.	1005
10:00 a. m.	120 c. c.	1005
12:00 m.	180 c. c.	1004
2:00 p. m.	160 c. c.	1005
4:00 p. m.	155 c. c.	1009
4:00 p. m. to 6:00 a. m.	625 c. c.	1007
		1585 c. c.

The blood showed sixty-seven milligrams of urea nitrogen to the 100 c. c. of blood. A few days later the urea nitrogen rose to eighty-five and seven tenths milligrams. These figures show, of course, that the excretory powers of the kidney were very much diminished and there was nitrogen retention. The facts that she was very thirsty and that the output of the urine was about the same as the intake of fluid corroborates the conclusions drawn from the examinations detailed above. It would be expected that under these conditions the urine would show the evidences of an interstitial process in the kidneys and that the blood pressure would be raised. Such, however, was not the case. The urine, although examined daily, had never shown casts or red cells.

The systolic blood pressure was 110 and the diastolic, 90.

The electrical reactions done at this time were as follows: C. C. C. 4.50, A. C. C. 2.00, A. O. C. 5.00, C. O. C. 3.50. That is to say, the low C. O. C. shows that she was still electrically oversensitive, although there were no clinical evidences of spasmophilia.

She was put on a low protein diet without salt and directed to drink large amounts of water. She was kept under observation in the outpatient department. On August 9th one of the outpatient physicians, who was not well acquainted with her story, ordered small amounts of bicarbonate of soda three times a day. The amount was not specified. Five days later she had tetanic manifestations lasting a few minutes. She was brought to the hospital the next day, August 15th, and admitted. The facial phenomenon and peroneal reflexes were present. The urine still showed the evidences of pyelitis and was of a low specific gravity, running along the next few days 1003, 4, 2, 4, 4, 5, 7, 6. The bicarbonate of soda was stopped at once. The peroneal reflex was gone August 19th and the facial phenomenon was barely obtainable. As it was thought that there might have been something spe-

cific in the action of soda, she was then given fifteen grains of citrate of potash every four hours, this being increased to thirty grains every four hours on August 23rd. Three days later the facial phenomenon was increased and the peroneal reflexes reappeared. The urine, however, was still acid. The citrate of potash was then stopped because of vomiting and a large number of loose, watery stools. It is presumable that the reason the citrate of potash did not cause more marked nervous symptoms is that much of the salt was carried away in the intestinal discharges. She was discharged from the hospital soon after, on her former diet with the low protein and forced fluids.

She was readmitted to the hospital for further study October 26, 1920, having been well since her discharge two months before. She had gained in weight and strength and symptomatically was well. The physical examination showed no evidences of spasmophilia. The examination of the blood resulted as follows: hemoglobin, eighty per cent. (Tallqvist), red corpuscles, 4,380,000, white corpuscles, 6,400, mononuclears, forty-four per cent., polynuclear neutrophiles, fifty-four per cent., and basophiles, two per cent. The red cells showed no abnormalities and the platelets were apparently normal in number.

The urine was pale, cloudy, acid in reaction, and of a specific gravity of 1006. It contained no albumin and only one millimetre of sediment after centrifugalization. This sediment showed leucocytes, but no bacteria. The phtalein test showed: First hour, 110 c. c. 1006, less than five per cent.; second hour, 84 c. c. 1007, less than five per cent.

The gravity fixation test showed:

	8:00 a. m.	115 c. c.	1006
	10:00 a. m.	145 c. c.	1004
	12:00 m.	105 c. c.	1006
	2:00 p. m.	45 c. c.	1004
	4:00 p. m.	70 c. c.	1006
	6:00 p. m.	60 c. c.	1005
6:00 p. m. to	6:00 a. m.	880 c. c.	1006

1420

The urea nitrogen unfortunately could not be done, as the chemist was ill at the time. The carbon dioxide tension in the alveolar air was thirty-five. The electrical reactions were: A. C. C. 6.00, A. O. C. 5.00, C. C. C. 2.50, and C. O. C. 6.00. The systolic blood pressure was 140 and the diastolic 110.

It is very hard to understand or explain the marked impairment of the excretory powers of the kidneys, there never having been at any time any evidence in the urine of disease of the kidneys themselves. It is hard to understand how a low grade inflammatory process in the pelves of the kidneys, which is the condition in pyelitis, could interfere with the excretory powers of the kidneys. Furthermore, there were no evidences of disease of the circulatory system, except the slight rise in blood pressure at the last examination. It is hard to believe that the pyelitis could by reflex action through the nervous system have had any such action. The tuberculin test was negative and there were no evidences of syphilis. Neither of these conditions would, moreover, be likely to cause the manifestations present in this instance. Neither

does it seem reasonable to suppose that such conditions as stone in the kidney, twisting or kinking of the ureters or displacement of the kidneys, even if it was possible for them to exist for so long a time without symptoms pointing definitely to them, would cause such a peculiar impairment of the functions of the kidneys.

The development of the spasmophilia is easier to explain. On account of the impairment of their functions the kidneys were unable to excrete the salts given for the treatment of the pyelitis. If spasmophilia is due, as it seems reasonable to suppose, to a disturbance of the balance between sodium and potassium on the one side and calcium and magnesium on the other, all the conditions necessary for the development of the disease were present. Practically, it makes no difference whether the balance was disturbed by a simple retention of sodium or potassium without any driving out of calcium and magnesium or by a combination of the two.

The prognosis seems absolutely bad. Even if it was possible to cure the pyelitis, that would presumably not improve the excretory powers of the kidneys, in fact, there is nothing which can be done to accomplish this. The only treatment seems to be to spare the kidneys as much as possible by limiting the proteins in the diet to minimum needs and to favor the elimination of excretory products through the kidneys by the administration of large amounts of water. Furthermore, the alkaline salts should be eliminated from the diet as far as possible and certainly none of them should be given for the treatment of the pyelitis.

70 BAY STATE ROAD.

SOME INTERESTING PEDIATRIC CASES

*With a New Method of Bacteriological Study and Treatment.**

BY MYER SOLIS-COHEN, A. B., M. D.,
Philadelphia,

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The bacteriological studies made in the four cases reported are based on a test for immunity and susceptibility described by the writer in conjunction with George D. Heist and Solomon Solis-Cohen (1). We found that the whole, fresh, uncoagulated blood of animals immune to pneumococcal infection, such as the pigeon and the chicken, killed the pneumococcus; while the whole blood of animals highly susceptible to pneumococcal infection, such as the mouse and the rabbit, served as an excellent culture medium for the pneumococcus. Similarly we found (1) that the globoid bodies grew vigorously in the whole blood of human beings, who are susceptible to acute anterior poliomyelitis, but were killed by the whole blood of rabbits, which are immune; and that diphtheria bacilli (2) multiplied rapidly in the whole blood of the susceptible guineapig and are destroyed by

*Read before the Philadelphia Pediatric Society, November 9, 1920. The bacteriological studies recorded in this paper were made in the Jules E. Mastbaum Research Laboratory of the Jewish Hospital.

the whole blood of the immune rat. Matsunami and Kolmer (3), using our method, demonstrated similarly that little or no growth of meningococci takes place in the fresh, whole blood of the immune rabbit, while in the susceptible mouse growth is vigorous. Incidental to our work we found that contaminating organisms usually failed to grow in whole uncoagulated blood.

These facts make us think that animals possess in their blood a bactericidal power against all organisms that are not pathogenic for them or for their species and lack bactericidal power against those organisms that are pathogenic for them or their species.

The question then arose in my mind whether infection in man might not be due to or associated with absent bactericidal power in the infected individual against the infecting organism. In such an event it might be possible from a number of organisms present in a discharge to separate those that are etiological or infecting from those that are merely saprophytic or accidental contaminations. At least, if the patient's blood were bactericidal to an organism present, it would be reasonable to infer that the patient was immune at the time to that organism, which consequently could hardly have any part in the infection. On the other hand, if the patient's blood had little or no bactericidal power against an organism present, it would indicate susceptibility on the part of the patient to that organism, which therefore might be regarded as possibly being an infecting organism. The late George D. Heist studied a number of cases with me at the Jules E. Mastbaum Research Laboratory of the Jewish Hospital and Louis S. Borow has studied others with me in the same laboratory. Our studies (4) demonstrate that the blood of human beings possesses bactericidal power against large numbers of organisms; that the blood of an individual differs in its bactericidal power against different organisms; that bactericidal power against a particular organism varies in different individuals; that in the discharge of an infected area organisms can usually be found against which the blood of the infected person has little or no bactericidal power; that frequently in such discharge or on such area other organisms are found against which the patient's blood has good bactericidal power; that organisms that are supposed to grow well in human blood fail to grow, at all in the blood of some individuals; and that organisms that are supposed to grow poorly or not at all in human blood may grow with the greatest vigor in the blood of some individuals.

The practical object of these studies was to make vaccine treatment more specific. It was thought that failure of autogenous vaccine treatment might be due sometimes to failure to include the etiological organisms in the autogenous vaccine and that certain harmful effects might be due to the injection of unnecessary foreign protein in the form of organisms that have no part in the infection. We regard the object of vaccine treatment to increase the bactericidal power of the blood against the infecting organism.

This view was based on observation made in

association with George D. Heist, and Solomon Solis-Cohen (1), that recovery from an attack of lobar pneumonia is paralleled by an increase in the power of the patient's blood to kill the type of pneumococcus causing the infection, and that the intravenous injection of dead pneumococci into rabbits produces bactericidal activity in the rabbit's blood which is specific to type. A similar rise in the bactericidal power of the blood was observed by Black, Fowler and Pierce (5) in rabbits following their intravenous, subcutaneous or intraperitoneal inoculation with dead typhoid bacilli and *Bacillus dysenteriae* of Shiga. We consequently regard it as at least unnecessary, if not harmful, to introduce into the system dead organisms against which the patient already has high bactericidal power.

In each of the four cases here reported an attempt had been made to discover the infecting organism; three received vaccines containing only those of the organisms present against which the patient's blood lacked bactericidal power; to the fourth serum was given. The cases are reported because of a number of interesting features they present. No assertion is made that the organisms obtained were actually etiological or that the improvement was due to the treatment. It is felt, however, that the results warrant further investigation and study of the method employed.

CASE I.—A. M. J., a baby girl, fourteen months old, was brought to my office on October 10, 1919. She had been a full term child, delivered normally. When four weeks old she had had diarrhea, which was cured after three months. When the child was nine months of age fever developed, the cause of which was obscure. The condition was regarded as acute double otitis media. Incision of both tympanic membranes had no effect on the high temperature, which persisted for two weeks. There was never any discharge from the ears, although a few particles were washed out. During the summer preceding her visit the baby had several attacks of fever accompanied by a whining cry of discomfort and evidences of pain. Apparently there had been no pain on urination, but there had occasionally been pain on defecation. During the last week in August the temperature had been 104° to 105°. Pus had been found in the urine in September and a diagnosis of pyelitis was made. Since then the pus had appeared and disappeared and the attacks had returned at intervals. Between the attacks the child was peevish and awakened at night. She had been in the best hands medically and had received the ordinary treatment.

Examination of the child was negative, except for a furunculosis, present chiefly on the buttocks. A culture on blood agar was made from the child's urine and from a papule on the buttocks. *Staphylococcus albus* and *Staphylococcus citreus* were isolated from both. A broth culture of each organism was diluted 1:10, 1:100, 1:1000 and 1:10,000 and each dilution was allowed to run in and out of a separate capillary tube, which was then filled with the baby's blood and sealed. After twenty-four hours' incubation the tubes were broken and a drop of each stained and examined under the microscope

to see if any organisms were present. *Staphylococcus citreus* had grown well in most of the tubes, but *Staphylococcus albus* had practically disappeared. A vaccine was prepared from *Staphylococcus citreus*.

TABLE I.
Dilutions of a twenty-four hours broth culture

Undil.	1:10	1:100	1:1,000	1:10,000
<i>Staphylococcus citreus</i>				
+ Case 1.....	±	—	+	++
<i>Staphylococcus citreus</i>				
+ Human Control.....	+	±	—	—
<i>Staphylococcus albus</i>				
+ Case 1.....	—	—	+	—
<i>Staphylococcus albus</i>				
+ Human Control.....	—	—	—	—

— Indicates no growth.
± Indicates doubtful growth.
+ Indicates growth.
++ Indicates vigorous growth.

Thirteen doses of a vaccine prepared from *Staphylococcus citreus* were administered at five day intervals, the dose being one hundred million, two hundred million, four hundred million, eight hundred million, and thereafter a thousand million. The baby improved in general health and appearance after the first dose. The crying spells with fever, etc., gradually diminished. The furunculosis cleared up. The urine showed some pus cells, on December 10, 1919, but none on February 26, 1920, or on October 25, 1920.

CASE II.—R. H., a little girl six years of age, came to my office on August 10, 1917, with a story that she had been subject since three years of age to attacks of high fever lasting two weeks, occurring chiefly in the spring and fall and preceded, accompanied and followed by weakness. These attacks had been diagnosed as malaria. For a year previous she had complained of frequent and urgent urination but had not wet her clothes. For the previous six months she had been irritable and easily upset, screaming and crying. She had lost weight. Physical examination was negative. The case at the time was regarded as one of enuresis and treated with tonic and belladonna, with some improvement. At this time the child was under observation for only three weeks.

Three years later, on August 16, 1920, the child returned with a history that the attacks with fever had continued, the last having been five days prior to the visit and the previous one two weeks before. Pain in the right lower abdomen had accompanied the last attack. The heart frequently became irregular during the attack. Between the attacks the child seemed well but had never been strong. She had lost weight, was always nervous and cried easily and frequently. Her appetite was poor. She had complained of palpitation and dyspnea on exertion for the past year and a half. For several years past she had suffered great distress when the bladder was full, which distress was somewhat relieved by doubling up. The urgency when the impulse to urinate came was so acute that she would wet herself if unable to relieve her bladder naturally.

The child was pale and poorly nourished. The heart was enlarged in all dimensions, its muscle was poor, and its action slightly irregular. There were some signs of infiltration of the upper lobe

of the right lung, without activity. The hemoglobin was sixty per cent. The urine showed pus cells in large numbers. A diagnosis was made of pyelocystitis. A blood agar culture of a catheterized specimen of urine contained *Bacillus coli* and *Bacillus lactis aerogenes*, both of which grew in the child's blood, the former very vigorously. This is the more remarkable as colon bacilli do not as a rule grow in human blood. Of fifteen men tested by George D. Heist and Solomon Solis-Cohen (6), *Bacillus coli* failed to grow in the blood of all.

TABLE II.

	Dilutions of a twenty-four hours broth culture				
	1:10	1:100	1:1,000	1:10,000	1:100,000
<i>Bacillus coli</i> + Case 2...	+	++	—	—	—
<i>Bacillus coli</i> + Human control	++	++	++	++	++
<i>Bacillus coli</i> + Defibrinated blood	++	++	++	++	++
<i>Bacillus lactis aerog.</i> + Case 2	++	++	++	++	++
<i>Bacillus lactis aerog.</i> + Human control	++	+	—	—	—
<i>Bacillus lactis aerog.</i> + Defibrinated blood	++	++	++	++	++

As a control, one set of tubes was loaded with defibrinated blood. When growth takes place in the defibrinated blood and not in the whole blood, it indicates the presence in the whole blood of an antibacterial factor which is lacking in the defibrinated blood.

A vaccine was made of both organisms. A first injection of twenty-five million on September 20, 1920, was not followed by any general reaction, but the arm was sore for two days. The arm was slightly sore for one day following the injection of fifty million on September 27th. Injection of seventy-five million a week later was followed by the development of a large areola with swelling and induration, lasting two days, and by the child becoming irritable and nervous. Two subsequent doses of fifty million each and two of sixty million and seventy-five million respectively, produced no reaction. Hexamethylenamine and liquor potassii citratis have also been administered. There has been distinct general improvement with a gain of five pounds and three quarters in seven weeks until the severe reaction. For the past six weeks the child has not experienced pain or urgency when the bladder is full and has not wet herself. Examination of the urine on November 9, 1920, showed only a few leucocytes.

CASE III.—L. W., a little girl, four years of age, was admitted to my service at the Jewish Hospital on July 20th, 1920. No history was obtainable. The child was well developed but rather poorly nourished and lay somewhat listless, suffering from orthopnea. The pupils were equal and reacted normally to light and accommodation. The tongue had a curious geographical appearance, the epithelium being apparently denuded in places, where the papilla were prominent, the normal epithelium about their margins forming linear ridges which described circinate designs. The pulse was regular, weak, and of low tension. The left chest was slightly fuller than the right. A double thrill was present over the precordia. The apex beat was in the fifth interspace, a quarter of an inch outside of the nipple. There was a diffuse, undulating pulsa-

tion from one inch to the right of the sternum to the left axilla and episternal notch. The heart extended upward to the upper border of the third rib, on the left to one inch to the left of the nipple, and on the right to half an inch to the right of the sternum. The heart sounds were obscured by murmurs which at first could not be well made out. Later a double murmur, crescendo in character, was heard definitely over the entire chest, and transmitted toward the axilla (2) and scapula. The lungs and abdomen were negative. The systolic blood pressure was 75 and the diastolic 50. The temperature curve was septic in type, reaching 100° every afternoon, being unaffected by sodium salicylate in doses of seven grains and a half every three hours, or by quinine and urea hydrochloride in three grain doses three times daily.

The rhinopharynx was cultured on August 12th and from the blood agar plate three organisms were isolated, gram diplococcus, diphtheroid and Micrococcus catarrhalis. When incubated in the child's blood, the first grew up well, the last irregularly and the other only in undiluted culture.

TABLE III.

	Dilutions of twenty-four hours broth culture	Undil.				
		1:10	1:100	1:1,000	1:10,000	
Gram diplococ. + Case 3	++	++	+	+	+	
Gram diplococ. + Human control	++	+	—	—	—	
Gram diplococ. + Defibrinated pig's blood	++	++	++	++	++	
Diphtheroid + Case 3	+	—	—	—	—	
Diphtheroid + Human control	+	—	—	—	—	
Diphtheroid + Defibrinated pig's blood	++	++	++	++	++	
Micrococ. catarrhalis + Case 3	—	0	+	—	+	
Micrococ. catarrhalis + Human control	++	—	±	—	—	
Micrococ. catarrhalis + Defibrinated pig's blood	++	++	++	++	++	

A vaccine was made of the gram diplococcus. Twenty-five million were administered on September 6th, and again six days later. A week later fifty million were given and ten days later a hundred million. There was never any reaction. The temperature had been practically below 99° since the second dose, most of the time being practically normal, until October 14th when it went up to 98.8°, going to 99° on October 18 and 99.4° on October 22d. I went off the service on October 1st and my successor failed to administer any more of the vaccine, which probably accounts for the subsequent rise in temperature. In my opinion the vaccine treatment should have been continued for several months.

CASE IV.—R. D. Upon coming on duty in the pediatric ward of the Jewish Hospital on July 1st of this year, I found a girl of ten years who had been admitted a week before with violent nose-bleed. The only points of interest in the family history were that a maternal uncle had been subject to severe hemorrhages, her mother was subject to urticaria, and her father used to perspire freely. The patient was said to have been a full term baby, with normal delivery, but to have weighed only three pounds at birth. She had never been ill until her third year, when she contracted pneumonia, followed by empyema, for which rib resection was performed. Convalescence was protracted for nine

months and the child had never been robust since, but had always been pale and had experienced dizziness. She never had had tonsilitis. A year previously she had had a vulvar abscess. She had had no cardiac symptoms prior to a year before, when the first epistaxis occurred upon stooping after running. Other nasal hemorrhages had occurred since, a very serious one four months before admission and another, also severe, one week before admission. She complained of excessive perspiration at night, on exertion and on excitement, but not of weakness, dyspnea or palpitation.

The child was poorly developed, poorly nourished, and very pale, her lips, gums and conjunctiva being extremely pale. The pupils were equal and reacted well to light and accommodation. The tongue was slightly coated. The pulse was 160, regular, weak, and of low tension. The apex beat was in the fifth interspace, anterior axillary line. There was a pulsation over the lower precordia. The cardiac boundaries were the upper border of the second rib, the left anterior axillary line and an inch and a half to the right of the sternum, the transverse diameter measuring six inches and a quarter and the vertical diameter four inches. At the mitral area a blowing systolic murmur, with probably a presystolic element, was heard, which was also heard all over the precordia and in the axilla. A soft systolic murmur was also heard at the base of the heart, more pronouncedly to the left of the sternum. In the sixth interspace in the left axilla was a scar two inches in length. There were no depressions above or below the clavicle.

The veins were slightly prominent over the chest. Expansion was slightly diminished. There was moderate dullness on the right anteriorly on, above and below on the clavicle and slight dullness below this down to the lower border of the second rib. There was dullness over the whole left chest anteriorly. The percussion note, though resonant, was somewhat impaired. Posteriorly there was dullness on the left above the third rib and on the right above the first rib and below the fourth rib, becoming flatness below the eighth rib. Fremitus was increased anteriorly on the right and diminished on the left. It was increased posteriorly on the right above the fifth rib and absent below the seventh rib, and on the left it was increased above the eighth rib. Vocal resonance anteriorly was increased on the right above the second rib with slight whispering pectoriloquy on the left above the second rib. Posteriorly it was increased on the right above the fourth rib and absent below the seventh rib, and increased slightly on the left between the fourth and eighth ribs, more markedly above. There was slight whispering pectoriloquy posteriorly above the third rib on the left. The breath sounds were faint anteriorly and negative posteriorly. The x ray demonstrated both lungs somewhat infiltrated, the right hilus showing many enlarged glands. The heart was seen to be greatly enlarged, mostly upwards and to the left. Stereoscopic examination with the tube thirty inches from the plate showed the greatest width of the heart to be six inches and the greatest height of the heart shadow four inches and a half. The urine con-

tained a faint trace of albumin, a few light granular casts and many leucocytes. The blood had a hemoglobin content of fifty per cent.; the leucocytic count was 7000 and the differential count, polymorphonuclear neutrophils sixty-nine per cent., large lymphocytes nine per cent., small lymphocytes twenty per cent., eosinophiles one per cent., basophiles one per cent. The clotting time of the blood taken with my modification of Milian's method (7) was ten minutes. The systolic blood pressure was 124 and the diastolic 55. The sputum contained pneumococci, streptococci, *Micrococcus catarrhalis*, pus cells and blood, but no tubercle bacilli. The vaginal smear was negative. No reaction followed the intracutaneous injection of old tuberculin (O. T.) in doses of 0.000,0001 mg., 0.000,01 mg., and 0.000,1 mg. The temperature was of the septic type.

My feeling was that an organism that had participated in the pneumonic process seven years before had caused the empyema and was probably responsible for the cardiac complication and possibly also for the vulvar abscess of a year previously. There was also a possibility that the pulmonary infiltration was a chronic process dating from and consequent to the pneumonia. It was thought that the etiological organism might be found on blood culture, but a culture of the blood on broth proved sterile. It was then thought that if the same organism was the infecting agent of both the heart and the lungs it would be found in the rhinopharynx and might be recognized by the absence of bactericidal power against it in the patient's blood. We employed a different method of culture and test than we used in the other cases, one that permits a rapid isolation and identification of the organisms against which the blood is lacking in bactericidal action, but which does not measure the degree of bactericidal power present. It is best applicable in adults and older children. A swab from the rhinopharynx was lightly rubbed on the bottom of a sterile test tube, into which five cubic centimetres of blood from the child's vein was then introduced. A culture was also made on a blood agar plate, upon which grew *Staphylococcus albus*, streptococcus and a diphtheroid bacillus. The culture in the child's blood was incubated for twenty-four hours and then a blood agar plate was inoculated with a drop of the blood.

A pure culture of many hemolytic streptococci grew up. We deemed it unwise to administer a vaccine and instead injected antistreptococcal serum. One dose of ten c. c., two doses of twenty c. c. and four doses of forty c. c. were given at intervals of from one to four days. After the third dose the temperature curve began to drop, reaching normal two days after the fourth dose and remaining normal two days later. It rose again and did not begin to fall again until two days after the last dose. A gradual decline then occurred, no rise over 99° occurring after the eighteenth day following the last dose, and there being little rise at all a month later and thereafter. The child improved clinically, being allowed to sit up in bed on August 14th, to sit on a chair a week later and to begin walking ten days subsequently.

She gained two pounds and three quarters in twelve days. Quinine and urea hydrochloride in five grain doses was given three times a day from August 5th to 10th and four times a day from August 10th to September 9th, without producing tinnitus. She was discharged from the hospital on October 8th, at which time she was walking about all day.

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2113 CHESTNUT STREET.

THE USE OF ATROPINE IN THE TREATMENT OF THE HYPERTONIC INFANT.*

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There exists in the hypertonic infant a definite physical and psychic syndrome which is characterized by hypertonicity of all the skeletal muscles. The symptoms presented by this class of infants are those of vagotonia. The occurrence of hypertonicity among infants is not rare. It is found in breast as well as bottle fed babies. The most common picture is that of the unhappy and restless baby, crying a great deal, sleeping for short periods only, and subject to frequent attacks of colic, accompanied by vomiting. Constipation is common. In spite of these symptoms the infant may be taking food regularly and show a satisfactory growth and increase in weight. Attempts to alter the food seem to have little or no effect in eradicating these symptoms. These mild manifestations generally go uncorrected until the infant takes solid food. In other cases malnutrition results from the vomiting and lack of sleep, presenting a serious picture.

The symptoms of hypertonia can be grouped under physical and psychic as outlined by Haas in his description of this condition. The physical symptoms are chiefly expressed by muscular irrita-

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bility, visible peristalsis, vomiting which begins in early infancy, mild at first but later becoming projectile in type, leading to a diagnosis of pylorospasm, constipation, and malnutrition. The psychic symptoms are general restlessness, crying, and insomnia. In studying these infants it becomes apparent that the fault is not with the food or environment, but with the infant itself. There is some mechanism in the hypertonic infant which is unstable and causes these manifestations.

In order to make clear the reason for using atropine in the treatment of this condition, it is important to review what is meant by the symptoms of vagotonia. The nervous system is made up of the sensorimotor and the vegetative systems. The vegetative is composed of the sympathetic and autonomic. Under normal conditions a sort of balance exists between the innervations in the two antagonistic systems, this balance being kept up probably by chemical action of hormones upon the nerve cells. Any disturbance in equilibrium may cause a temporary upset in the exercise of physiological function. In vagotonia there are various clinical symptoms indicating heightened tonus throughout the craniosacral autonomic system. This heightened tonus may cause stimulation of the vagus, which would lead to turbulent gastric peristalsis which readily changes into retrograde peristalsis and may manifest itself in vomiting. As atropine paralyzes the vagus and causes a relaxation of the intestines, its use can readily be seen in this condition. Inasmuch as there is a close relationship between the autonomic nervous system and the glands of internal secretion it must have an influence upon the mechanism of digestion.

If the assumption that the disorder is due to impaired action of the vegetative nervous system is correct, the use of atropine as a therapeutic agent is sound. Atropine is the drug of choice of those paralyzing the vagus endings, inasmuch as it is well tolerated by infants and particularly by the hypertonic baby. To procure desired results it must be administered accurately, bearing in mind that an active preparation is essential and that the drug deteriorates. The method of treatment as outlined by Haas has given the best results and has been followed in these cases. A one in a thousand solution is used. The usual dose to begin with is one drop or one thousandth of a grain in each feeding, or in a small amount of water before breast feedings. The mother or nurse is informed of the toxic symptoms. The dose is increased to two drops for the next twenty-four hours if no untoward symptoms develop. In order to procure the desired relief of symptoms three or four drops six or seven times a day may be necessary. The average hypertonic infant will tolerate from one fiftieth to one twenty-fifth of a grain of atropine a day. It is rare to find an infant in whom a thousandth of a grain will cause flushing of the face. The toxic symptoms that develop, in the order of their frequency, are: Flushing or reddening of the face and body (this may simulate a scarlet fever rash); dilated pupils and absence of reaction to light; dryness of the lips and mouth and inability to secrete tears; irritability with evidences of jerky

movements. The symptoms are not serious as in most instances the flushing is first observed, which disappears in a short time after discontinuing the use of the drug.

The hypertonic infants treated presented different pictures, but the treatment was the same as far as the use of atropine was concerned. In most cases there was no change in diet, although it was necessary to make additions to the dietary as soon as the irritability was lessened. A description of a few type cases representing the different groups of symptoms manifested in the hypertonic infant will give a better picture of the results of the treatment.

REPORT OF CASES.

CASE I.—Raymond B., normal, full term baby; birth weight seven and one half pounds. He was breast fed for two months; did poorly on breast, vomited frequently, had colic, and was restless. The baby was put on a whole milk mixture, but no improvement was noted. When first seen the baby was three months of age and presented the following symptoms: Vomiting with no relation to feedings, marked irritability, restlessness, crying, and insomnia. The weight was eight pounds. The stools were well digested and the formula seemed to be a rational one, so was not changed. Two drops of a one thousandth solution of atropine were given in each feeding. A definite improvement was noted in forty-eight hours. The vomiting ceased, there was less crying, and the infant slept better. There was a gain in weight the first week, which continued. In the next six weeks the baby gained two and a half pounds and seemed to be normal in every respect.

CASE II.—Lena G. was sixteen months old when she was sent into the hospital. She had always been an irritable baby and no food seemed to agree with her. For some months she had been taking cow's milk, but made no appreciable gain. On entrance her weight was fourteen and a half pounds. Crying was the outstanding symptom; this was so severe that it was feared the child would go into convulsions. The crying spells occurred frequently at night. There was a mild diarrhea, but no vomiting. It was estimated that the baby was getting sufficient food, though apparently not assimilating enough. Assured there was nothing else at fault but the hypertonicity, atropine was administered.

There was a rapid movement in the general condition of the child. The child became happy and contented, crying little and sleeping all night. With increased food the weight went from fourteen and a half to nineteen pounds and three quarters in seven weeks. The atropine was discontinued after six weeks.

CASE III.—John S. was a full term baby. He had breast milk for only two weeks. Cow's milk and a prepared food were given. The birth weight was seven and a quarter pounds. At the end of the third week vomiting began, which became more and more severe and eventually projectile in type. Little food was retained and it became difficult to secure a bowel movement. At the end of the fifth week, when the baby was first seen, it presented the picture of a starved baby. The least little sound would startle it. There was visible peristalsis and pro-

jectile vomiting, but no tumor mass felt. The weight was seven pounds. A diagnosis of hypertonia and pylorospasm was made. The color was poor and on the whole the prognosis did not seem good. The baby was first given a thick gruel feeding but even this could not be retained until atropine had been given. No results were obtained until three drops were given before each feeding. The intestinal activity became less marked and the food was retained. When the vomiting ceased the old formula of milk and the prepared food was again given. The irritability subsided and the baby began to gain. From June 5th to September 2nd the baby gained five and a quarter pounds and seemed normal in every way. Twice the atropine was discontinued and promptly the vomiting returned. Now the mother does not dare leave out the atropine.

In the last six months ten babies classified as hypertonic infants have been treated in this way. A marked improvement followed in all with the use of atropine, without any change in diet. It must be remembered that not all cases of vomiting, constipation and malnutrition are due to hypertonia, so unless the use of atropine is restricted to undoubted cases of hypertonicity, failure will result. Corrections in diet and habits should be made, but if in spite of this the infant presents symptoms of irritability atropine should be tried. The use of atropine will soon demonstrate the correctness of the diagnosis, for the relief of symptoms is evident in a few days and improvement continues as long as the drug is maintained. Atropine must be continued for a variable time.

SUMMARY.

The hypertonic infant presents a definite clinical picture, due to a disturbance of the autonomic nervous system which gives rise to physical and psychic disturbances.

The usual manifestations are irregular vomiting often with visible peristalsis, constipation, malnutrition, muscular irritability, representing the physical defects, and with insomnia and crying as psychic disturbances.

The diet usually needs no change in the hypertonic infant and the food is well digested.

A solution of atropine gives early relief of symptoms in these cases and thereby metabolism is increased, bringing about the desired gain in weight.

The use of the atropine is not dangerous if given in guarded doses and the early toxic symptoms are noted.

29 BUCKINGHAM STREET.

Case of Lethargic Encephalitis with Post-mortem Examination.—Ducamp, Blouquier de Claret, and Tzélépoglou (*Bulletin de l'Académie de médecine*, May 11, 1920) report a typical fatal case of lethargic encephalitis with pathological study of the brain. The lesions at present considered characteristic of the disorder were found, namely, acute perivascularitis with diapedesis and cellular degeneration, the process as a whole being situated particularly in the gray matter of the mid-brain. The cause of certain ocular disturbances witnessed during life was accounted for by degenerative changes in the corresponding centres.

THE CLASS METHOD OF TREATING MALNUTRITION IN CHILDREN.*

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At the outset in a paper on malnutrition in children it might be well to make clear what shall be understood by malnutrition, subnutrition, or undernourishment. Emerson, of Boston, at first classed as undernourished any child ten per cent. under weight for his height, but later he made seven per cent. the standard. This is one criterion by which to judge the state of nutrition of any child, but there are other factors involved, and it has seemed to some of us interested in this work that a child can be up to the standard of weight for its height and still be sufficiently undernourished to attract attention and require active treatment. Dr. George Newman, chief medical officer of the Board of Education for England and Wales, clearly has this in mind when, in his annual report for 1915-16 he defines malnutrition as "a low condition of health and body substance. It is measurable not only by height and weight and robustness, but by many other signs and symptoms." These signs are the color, the brightness of the eyes, the carriage, the disposition, sleep, digestion, regularity of the bowels, and the condition of the muscles.

Malnutrition in childhood is the underlying reason for the alarming proportion of defects and rejections found in the physical examination of recruits in the late war. It has been estimated by Emerson and other observers that about a third of all school children are undernourished, and yet this school age is the one most neglected by the average practitioner and medical school teacher.

The student, whether undergraduate or graduate, has the importance constantly impressed upon him of the feeding and general care of the infant up to the end of the first year of life; there is much less attention paid to the welfare of the child during the next period of early childhood, whereas once he reaches the school age he gets scarcely any attention at all.

If the school child has glaring defects they are noted by the school physician in his routine examination, but he cannot compel their correction. As a result there is in every community a veritable army of children whose appearance is such that with a casual looking over they will pass as normal in health and nutrition, whereas they may be in such a state of subnutrition as not only to render them more susceptible to disease but also to prejudice their chance and right to grow up to normal adult height, weight, and health.

Causes of malnutrition may be divided into real disease or abnormal condition, and faulty hygiene and diet. In the first class three conditions occupy the foreground, namely, diseased tonsils, tuberculosis, and concealed or latent congenital lues. Tuberculosis is usually glandular in its origin in childhood and the mediastinal gland groups should

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especially be suspected. Here the x ray and D'Espine's sign will help in the diagnosis. Our conception of this sign is based upon the original interpretation of D'Espine (1) himself, who wrote: "The first signs of bronchial adenopathy are furnished by the auscultation of the voice, and are observed almost always in the immediate neighborhood of the vertebral column, between the seventh cervical and upper dorsal vertebræ, either in the supraspinous fossa or lower down in the interscapular space. They consist in a timbre added to the voice which one may call whispering (*chuchotement*) in the first stage, and bronchophony in a later stage." We have always considered any whispering bronchophony below the level of the seventh cervical vertebra as presumptive evidence of the existence of enlarged bronchial glands, whether tuberculous or not.

Persistent failure of a child to gain after the performance of corrective measures, such as tonsillectomy and dental repair, is always suggestive of either tuberculosis or congenital lues. In the absence of a positive Wassermann test certain dental stigmata may help in the diagnosis of lues. These are the separation of the upper central incisors first described by Roberts and the presence of accessory cusps on the upper permanent molars first reported by Sabouraud.

Diseased tonsils are now looked upon, with other factors in nasopharyngeal obstruction, as more common in the cause of malnutrition than carious teeth. One reason for this is that at the age when undernourishment is most marked, namely, the preschool and early school years, caries exists mainly in the persisting deciduous teeth, whose apices and roots have been partially or wholly absorbed, and hence focal infection from apical abscesses is physically improbable.

Cyclic vomiting or food idiosyncrasies may be found to be causative factors in many cases representing real food sensitization, which may be verified and the treatment indicated by doing the skin tests with the various proteins. Organic disease of the kidneys, blood, intestines, especially the presence of intestinal parasites, must be ruled out or corrected before the case will respond to the general treatment laid down for the undernourished child.

The second class of cases are not due to real disease, but to errors of hygiene or diet, or to the abuse or improper use of exercise and muscular activity. Food may be insufficient in many ways. It may be insufficient in quantity and, therefore, cause constipation from lack of bulk in the bowel, or it may be deficient in calories or vitamins, or both. Especially to be mentioned and condemned are tea, coffee, candy and ice cream between meals, cake, thin broths, too much fluid at meals, and similar errors in diet.

Factors other than food in the causation of malnutrition were well brought out in a paper read before the Child Welfare Convention in New York in May, 1920, by Dr. Hugh L. Chaplin. We can heartily endorse his statements regarding the importance of insufficient sleep, improper ventilation of rooms during sleep, too short lunch periods, insufficient or too much exercise, uncleanliness of the

body, and many other faulty habits of life. The undernourished child should be looked upon as a sick child and his habits and activities should be regulated and not left to him to decide. These children are possessed of a restless spirit out of proportion to their physical strength, and if left to their own inclinations will exhaust themselves and prevent the desired gain in weight and strength. It has been found that these children become physically tired in the early afternoon and, therefore, it has been made a universal rule in this work to insist on a rest period of preferably a whole hour after school, with the taking of a light lunch of bread and butter and a glass of milk to restore the flagging energy of the undernourished body.

Within recent years there has been a startling awakening to the vital importance of the malnutrition problem in school children, and, as the most efficient and practicable method of combatting the evil has been found to be the nutrition class, it would seem that a brief history of class methods deserves a place here. Investigation of the literature reveals the fact that as far back as 1890, Dr. Minor, of Asheville, N. C., used the class method of treating tuberculosis in his private patients. However, it was not until July, 1905, that this method was applied to poor patients by Dr. J. H. Pratt, of Boston, who in that month organized the Emanuel Church Tuberculosis Class, which met at the Massachusetts General Hospital, and for which funds were provided by the church from which it derived its name. This was the first attempt to treat poor patients in their homes in a large city. The patients were given directions as to hygiene, rest, outdoor air, and other essentials, and were instructed to keep a record of their temperature, hours of rest, food taken, action of the bowels, and other data. This record was brought to the weekly meeting of the class, where it was gone over by the medical director, who gave such individual advice as seemed necessary and then gave a talk to the whole class. It was happily seen at the outset of this class work that a social service worker or visiting nurse was indispensable, and this agrees perfectly with the experience of everyone who has since attempted to conduct a class of any kind, whether in tuberculosis, cardiac disorders, or nutrition. In 1906, Dr. John B. Hawes, 2nd, also of Boston, organized the Suburban Tuberculosis Class, with equally good results, and from that time on the class treatment has been allied to various conditions with gratifying results.

Having taken up the development of the class method of treatment, we naturally go on to the application of this method to the treatment of nutritional disturbances in children especially of the school age. It seems that the first serious attention to the problem was given in England during the Boer war, when the war department was chagrined at the enormous number of rejections of applicants for enlistment in the Army and Navy. This gave rise to an investigation, after the war, of the health conditions in the schools, resulting in the providing of school lunches in the endeavor to correct malnutrition. These lunches were finally given up as inefficacious.

On this continent Dr. W. R. P. Emerson (2), of Boston, was the pioneer not only in calling attention to the widespread existence of malnutrition in school children, but also in organizing classes for its treatment. In the fall of 1908 he collected fifteen children at the Boston Dispensary, who were the weakest and poorest nourished of four or five thousand children seen during that year. He laid down rules of rest, hygiene, diet, and of conduct of the class, which have required remarkably few changes up to the present time, and he has regarded from the beginning as indispensable the services of a good social worker to visit the homes of the children. By the aid of such a worker it is possible to find out on what floor the child lives and, therefore, whether excessive stair climbing has a bearing on the case, whether there is overcrowding in the household, whether the mother is preparing or knows how to properly prepare the food prescribed.

Having secured the assistance of such a social worker, the next important point in the organization of a nutrition class is the preparation of a proper physical examination blank. Emerson again was the first to draw attention to the necessity of a complete standardized blank form. Whatever form is adopted there are a few essentials to its rapid and practical use, namely, the placing in such a prominent position as to be seen at a glance, the child's age, height, weight for height and age, average normal weight for height and age, number of pounds below weight, and percentage below weight. In most blanks available these figures are placed in such a position and in such a part of the form as not to be easily found. Other requisites are suitable rooms for weighing, accurate scales and measuring rods, a large table of weight standards so placed as to be seen at a glance; if possible, a food exhibit in wax or other plastic material which may be studied by the children and their mothers while awaiting their examination, and which may be used by the class director or nurse for demonstrating relative food values.

A special point which has been taken up in the Brooklyn Hospital Nutrition Class, and which presents great possibilities, is the utilization of what is otherwise wasted time in the presentation of suitable moving picture films, or the instructive and amusing antics of Cho-Cho the Health Clown, or the dazzling appearance of the Health Fairy. The Health Department of the State of New York has educational motion picture films available for this purpose. In order that the nutrition class or clinic may be able to do its best work without handicap, there should be the closest interlocking and cooperation of the other clinics in the hospital, such as the eye, ear, nose and throat, the orthopedic and the surgical. Furthermore, there should be active and real cooperation of the indoor department of the hospital so that cases sent into the hospital for treatment or operation should have the corrective measures advised by the nutrition clinic carried out, and of the greatest importance, so that a complete and accurate record of such treatment should be sent back to the clinic for the intelligent further nutritional management of the case. Of great value in the actual conduct of the class have been found

two forms, for which we are indebted to Dr. Charles Hendee Smith, of Bellevue, namely, the home record sheet and the complete diet list for the guidance of the mother in the preparation of the food. The home record sheet is given to each child at its first visit to have recorded thereon a full report of activities and food taken for forty-eight hours, and this is repeated when at any time the child ceases to gain and a cause for such failure is sought. A suitable weight chart is necessary, competition is encouraged by the offering of rewards for gain in weight, or carrying out of corrective measures, and, finally, in order to know definitely the efficacy of hygienic, dietetic and corrective measures, no medicine is given where it is possible to avoid it.

By the carrying out of these simple measures, without the administration of any medicine, whether tonics or otherwise, a large group of undernourished children have been made to gain in a nutrition class at Brooklyn Hospital at almost one and a half times the normal rate. The actual figures of the class record for six months will be considered elsewhere.

From a review of the literature, from personal interviews with other workers in this field, and from personal experience in the conduct of a nutrition class, the following conclusions seem justified:

1. Malnutrition is widespread in children, especially those of the school and preschool age.
2. The class method is the one of choice in the treatment of malnutrition cases.
3. Essentials in the efficient conduct of a nutrition class are a trained social service worker, a thorough physical examination recorded on a standardized blank, correction of organic defects and of faulty diet, insistence on rest periods during the day, the arousing and sustaining of the child's interest.

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SIX MONTHS' EXPERIENCE WITH A NUTRITION CLASS.*

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The nutrition class of the Brooklyn Hospital commenced its work at about the beginning of the current year with a small initial attendance. Membership in the class was limited to children of school and kindergarten age five per cent. or more under weight. The class increased in size so rapidly that after two months no more new material was added, and intensive work continued with the fifty children in attendance. This number has formed a basis for our present report and conclusions.

Before proceeding with our figures it should be borne in mind that the average child we had to deal with was rather satisfied with the old factors of its environment, and that the work which we attempted to do imposed a sort of burden which some were unwilling to assume. Thus, it had been the custom of our average child to rise late, eat a hurried breakfast without washing its hands and face or brushing the teeth. The midday meal would be rushed through in the same manner. After school the child would remain playing in the street till sunset or later, or would be put to some quasi-profitable task at home. After the evening meal the child would resume its recreation outdoors, often until midnight. Toothbrushes as personal property were almost unheard of, and a bath was either a monthly feature or a pleasure indulged in only during the warm season, when the family enjoyed its weekly immersion in the surf.

The nutrition class came and superseded this unhygienic routine by a more rational regimen, more healthful and natural. There was a good measure of inertia to overcome, and the work often taxed all the ingenuity of physician, nurse, and social worker. The mother, whose cooperation was essential to our success, was often hard to win over, due chiefly to her ignorance of our purpose and to the novelty of the idea. She probably considered our efforts an interference with her domestic régime, hence the indifference which occasionally militated against our endeavors. To these factors must be added the poor intellectual material generally prevailing in our field of operations. Our nurse has had to contend with these obstacles, and even after much patient coaching, we have often received but a weak response. For example, a child advised to take an afternoon nap would be put by the mother to the task of pulling bastings or sewing on buttons, and as a result she lost her opportunity either for sleep or for outdoor exercise. Again, a mother of seven children, one of whom is the object of our study and help, would not prepare any cereal for the morning meal when they were accustomed to bread and butter and coffee. It was therefore much easier for us to give advice than for them to follow it.

The following figures are based on our records:

Total number of children, fifty.
Period of observation, six months.

Average age, eight years eight and one half months.
Average height, forty-nine inches.
Average weight on admission, fifty-two and one half pounds.
Normal weight for age and height, fifty-seven pounds.
Average per cent. under weight on admission, eight.
Average weight at the end of six months, fifty-four pounds thirteen ounces.
Normal weight for age and height at the end of six months, fifty-eight pounds.
Average per cent. under weight at the end of six months, five and one half.

ANALYSIS OF OUR FIGURES.

Attendance.—The average number of visits of each child was nine and five tenths, or about thirty-five per cent. of the total. The older children were more faithful in this regard, since distance and the weather did not interfere so much with their attendance. The younger members, however, had to come accompanied by a parent or an older child, hence the larger number of absences. Influenza and the usual seasonal respiratory diseases kept some children away for a month or longer. However, once the interest was acquired, many children presented themselves every Saturday morning for a number of weeks in succession.

Age.—The youngest member of the class was five and the oldest fourteen. The older children could be reasoned with more successfully and their co-operation gained more easily than the younger ones, who could not fix their attention very long, and in whom the interest in the class was likely to lag quickly.

Weight.—Our standard was the table of weights for both sexes at different ages and heights issued by the Child Health Organization. We assume that a normal steady gain in weight indicates general good health, except in cases of myxedema, nephritis and other infrequent conditions. Our aim has been to regulate the life of the child so that it would show a gradually mounting weight curve, although such a curve often showed many capricious variations which at times were difficult to explain. One child would gain but little under most careful supervision and strict obedience of orders as to diet and hygiene. Another would gain considerably in spite of poor all around management. While a child of eight or nine years should gain two pounds in six months, our children showed an average gain of two and one half pounds, reducing the percentage under weight from eight to five and five tenths. There was no great accuracy in weighing, since the children were weighed in their stockings, with all their clothes on, and their clothes would vary inevitably with the season and the weather. Again, the scales themselves were a considerable source of error, since they varied under changing conditions of weather, roughness of handling, and length of time in use. However, all these errors are minimized when the figures covered fifty children for a period of six months.

Defects.—The detection and elimination of defects formed a large and important part of our work. After a thorough physical examination, various defects were discovered and noted. Twenty had one or more carious teeth; these children were referred for dental treatment. Four were found to have stigmata of congenital lues, and our diagnosis was

*Read before the Medical Society of the County of Kings, Brooklyn, New York City, October 19, 1920.

confirmed in each instance by the Wassermann test; these too were referred for treatment. Nineteen had diseased tonsils and adenoids; ten had them removed and the others are awaiting their turn. Twenty-four showed a positive D'Espine's sign, the meaning of which has been ably discussed by Dr. Donnelly. One had kyphosis and one scoliosis; one had phimosis; one had spastic paraplegia.

Procedure.—The general procedure with the class was as follows: Each new member at his first visit underwent a complete physical examination, and all findings, both positive and negative, were entered on a well planned and comprehensive chart. Here a prominent place was reserved for the summary of defects, which determined our treatment of the case. Height, and weight for height and age, were recorded, as well as the normal weight according to our standard table of weights. Laboratory work, such as a Wassermann test, blood count and urine examination, was done if necessary. Whenever any special examination or treatment was indicated, the child was referred to the several special departments of the hospital. Upon revisits the child was weighed and the weekly gain or loss in weight recorded. Then followed an individual conference with the child and the parent. The daily routine of the child was closely reviewed, and the questions of diet, sleep, play, and personal hygiene were thoroughly gone into and advice given accordingly. If there was a loss in weight this conference was particularly earnest and searching. The work of the morning was wound up with a short, simple and direct talk by one of the staff, addressed to the children and parents, epitomizing the experience of the morning and drawing conclusions therefrom. Sometimes it took the form of a quiz, utilizing the apperceptive mass of the children in teaching them the elementary principles of diet, hygiene and health.

CONCLUSIONS.

While these fifty children are still below par in state of nutrition, considerable improvement has been shown during the period of our work, being now only five and five tenths per cent. under weight. It must be remembered that these children came to us on account of their poor nutritional status. We have apparently succeeded in raising them to a nutritional level, where they are accomplishing what is expected of a normal child in this regard. They are all quite familiar with what we are trying to do, and are desirous of going ahead with the work. They are enthusiastic about it, and a friendly rivalry has sprung up among them as to the greatest gain in weight. By gaining the child's confidence and by showing it the way we hope to prosecute the work with even greater success than heretofore. We believe that if similar work is undertaken in every congested district of our larger cities it will greatly contribute toward making stronger men and women and better citizens.

958 EASTERN PARKWAY.

Edema in Children Due to Fat Starvation.—A. B. Grubb (*Western Medical Times*, June 1920) says that edema in children is very often due to fat starvation and will respond within a few days to butter and cream.

SIMPLIFIED INFANT FEEDING.*

A Rational Feeding Program for the First Year of Life.

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Infant feeding, whether simplified or complicated, is something to be approached with caution. The changes have been rung upon it so often and in so many different keys that one feels like treading lightly and asking for a special dispensation for discussing it. And yet I think that no one will deny that infant feeding needs simplifying, if there is any subject within the broad scope of modern medicine that does. There are, perhaps, a number of reasons for this. Pediatrics, along with a number of other subjects in the medical curriculum that are of greater age as recognized specialties, is considered a minor subject in our medical schools, and is crowded out of the students' time and interest by other supposedly more important subjects. And yet pediatrics is the only branch of the whole array that deals with the well organism, and the only specialty that must be practised by the general practitioner.

As a result of this compression of a large and important subject into such a very small compass, the professor and instructors are inclined to emphasize the striking cases, the types less commonly encountered, rather than to dwell upon those far commoner and hence (to them) less interesting problems of everyday occurrence, and especially those concerned with infant feeding. The subject of infant feeding itself is one that has given rise to most acrimonious debate, due to honest divergence of opinion on the part of widely differing schools of thought. This difference of opinion as to what constitutes a satisfactory system for the feeding of infants has been able to persist as it has, because of the relatively wide limits of tolerance possessed by different infants, and by the same infant at different times for the most widely differing articles of diet. We have each of us but to consult our very recent memory in order to recall some perfect specimen of babyhood that has arrived at this condition on some feeding that we would have said must surely lead to speedy marasmus—explicable on no other grounds than the tremendously wide limits of food tolerance possessed by some babies.

The fact that such widely differing schools of thought could each of them point to a highly satisfying and successful series of cases, has led each group to believe that it had fairly solved the problem of infant feeding. It has also caused each group to doubt the possibility of attaining the equally successful series of cases claimed by the proponents of some entirely different set of principles. All have perhaps failed to put proper emphasis upon the fact that a great body of babies, fed according to any old methods or no methods at all, were worrying along perhaps almost as well as some of their special series had been doing. They had been

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studying especially the sick baby, with his greatly narrowed limits of food tolerance due to the food injury that he had sustained; and had failed to attempt to formulate, from the experiences of this large mass of carelessly fed but fairly healthy babies. This is a simple method that could be readily taught the average student, graduate or undergraduate, and by him passed on to the average mother or nurse. In other words, the student has been taught a complicated method of feeding, desirable enough perhaps in special cases of food injury, but by no means essential for the great mass of well babies. Accordingly, he has been well nigh helpless in the face of the demand of the mothers for instructions for the feeding of their well children. This occurred because he had never been taught a simple system which simple folk, with a well baby, would take the time and trouble to follow.

The result of this lack of a definite routine procedure for use in the case of the average well child, such as can readily be taught to, and learned by, the average medical student, and by him translated into simple instructions for the average mother or nurse to carry out from day to day, can frequently be seen. We know that many otherwise able and conscientious physicians never attempt to interfere in the management of the well babies of their families. They regularly allow some elderly female to use her experiences of a generation ago to decide proportions, dilutions, quantities, and feeding intervals, for instructing the young mother when to take her baby away from the breast! Others, when appealed to, turn with a sigh of relief to the proprietary foods, which never fail to promise most flattering results—and at times, let us be frank enough to admit, achieve them. Many babies, we know, with the broad limits of tolerance that we have spoken of, survive this catch-as-catch-can process. Many more succumb.

While granting that we must individualize, even with our well babies, just as we individualize in cases of typhoid fever and in appendectomies, we can standardize and teach infant feeding just as we standardize and teach typhoid therapy and surgical technic. It does not seem too much to ask that the outlining of general principles should precede rules for specialization to meet individual conditions.

I have been brought to believe, from a survey of my own experience, that a large proportion of the cases that are referred, or drift, to the man practising pediatrics exclusively, whether in private practice or in hospital work, are feeding babies that could have been handled perfectly well by the family physician. He has failed, from the lack of a definite technic, to apply in his infant feeding cases the routine procedures which he is wont to apply in other cases. In other words, the pediatricist is achieving much of his reputation as the result of his successes with easy feeding cases, instead of being compelled to tax his skill and ingenuity over the difficult ones alone. If this is true, then there is a serious flaw somewhere in the program of medical education today. For the future welfare of the race is in the hands, not of the pediatricist, who sees comparatively few of the entire infant popu-

lation, but of the family doctor, who, sooner or later, sees the vast majority of them at least once in their lives. But it is to the pediatricist that the family practitioner, when in the embryo stage represented by the medical student, looks for his instruction in this most important matter. If we fail him (and my memory of the instruction given me during my undergraduate years leads me to think that we are failing him), can we blame him when he allows that more plausible teacher, the detail man from the proprietary food concern, to usurp the seat in the teaching chair that has been so inadequately filled?

And yet, hand in hand with this admitted unfamiliarity with the intricacies of infant feeding on the part of the great majority of the medical profession, goes a most amazing readiness to wean babies for the most trivial and inadequate of reasons. When one has struggled as desperately as every man in this section has done, over the artificial alimentation of a puzzling case, one is simply awestruck at the *sang froid* with which babies are taken away from the breast, every day, for causes so trifling as to be laughable, were not the results likely to be so serious and even tragic. "The baby doesn't get enough milk"; "I never have been able to nurse my babies"; "My milk is blue and watery—I know it doesn't nourish the baby"; "My baby didn't gain this week"; "My milk poisons the baby," or any one of a dozen other such statements that should mean nothing more radical than an inquiry by the physician into the state of nursing affairs, and some simple adjustment or explanation, ushers in the change from nature's feeding, which works so well that no one needs to understand it, to bottle feeding, which is admittedly the poorest of substitutes, and is wretchedly understood by the most learned. As often as not it is the grandmother, the aunt, or the nurse, who blithely crosses this Rubicon, with never a qualm over future hazards and never a regret over bridges burned behind. One can hardly imagine a shipwrecked sailor's pushing away his life preserver, or a mountain climber tossing away his hobnailed boots; and yet either of these would be taking a far less serious risk than is thus imposed upon the infant whose breast alimentation is thus discontinued for these absolutely inadequate causes.

I, personally, am firmly convinced of what is by no means universally conceded or recognized, namely, that practically every mother can succeed in nursing her own child. I say practically, advisedly, in the face of the testimony of the textbooks, which are fond of citing cases of congenital or acquired intolerance on the part of certain infants toward their mother's milk. I am willing to go a step farther and concede that probably each man here can call to mind one or more cases in his own experience in which every effort to keep a baby on its mother's milk failed ignominiously. And yet, to strike a quick percentage, what tiny fraction of a per cent. is represented in the practice of anyone who recalls such a case of so-called toxicity or idiosyncrasy, as compared with the total number of babies he has seen? We have all of us heard or read of the existence of two headed calves, and

yet we do not ordinarily construct our stanchions so as to accommodate these rare freaks of nature.

I do not assert that every mother can carry her baby through the nine months that we set aside for lactation, without help, but I do say that, given a realization on the part of the mother and of her medical attendant, of the truth in her particular case of what both recognize to be true in the vast majority of cases; and every man who wishes it can reduce his panel of exclusively bottle fed babies almost to the irreducible minimum supplied by motherless babies, and those that have been weaned three or four weeks before he sees them. And, if we are to credit the results of Moore, of Portland, Oregon, as set forth in his fascinating paper (1), even this minimum may prove not to be an irreducible one, for he records a case of reestablishment of breast feeding after eight weeks of weaning, and another after eleven.

Granted, then, that mother and physician are in accord, and resolved to do their best to keep the baby on the breast, what can we do to help them? In view of the universally admitted superiority of breast feeding, it is rather surprising that we can find so little, relatively speaking, of real practical help in the textbooks or in the literature, to aid us in this task. The task is a twofold one: first, the maintenance of lactation, and, secondly, the adjustment of the milk to the baby, or of the baby to the milk. In comparison with the volumes and reams devoted to the intricacies of artificial feeding, the space given to the problems connected with the far more common form of breast feeding, seems almost negligible. I want to outline the regimen that has been found most successful here, emphasizing the details, which are perhaps the most important feature in the management. In a word, this consists in the inauguration of what is variously known as auxiliary, complementary, or supplementary feeding.

By whatever name we call it, let it be distinctly understood that what is meant is offering the baby a bottle, with a formula appropriate to its age, weight, and general condition, after every breast feeding, and letting him take as much or as little of it as he will. What is not meant is alternate breast and bottle feeding, for reasons that will be dealt with directly. The baby may be kept anywhere from five to thirty minutes at the breast, until he shows, in short, by his restlessness and the tossing about of his head, that he has about exhausted the possibilities of the one breast. He is then allowed to swing over to the bottle, previously heated and in readiness, and permitted to take as much as he will of the complementary feeding. It is probably well within the bounds of truth to say (grandmothers to the contrary notwithstanding) that a reasonably well baby never overeats, if given a food of the proper strength. Colic, so-called, from this cause can, far more often than is realized, be proved to be nothing but hunger, by allowing the child to take even more of the food than he has already taken. Even that infallible argument, "Why, doctor, I know it's colic; he just draws his little legs up on his stomach when he cries," will fail of effect when the mother sees the colicky baby

fall asleep just as soon as he is allowed to be the judge of his own capacity. In other words, we are quite safe in allowing the baby in this way to tell us how much too little breast milk he is getting.

The following ideas should gradually be inculcated in the mind of the mother. It is especially useful, in this connection, to give a small slip or folder, preferably typed or printed in simple language, embodying these points:

1. That she should get away from the baby at least once in the twenty-four hours—for the sake of both of them.

2. That she should get enough sleep, eight hours representing a minimum rather than a maximum.

3. That worry is a great milk reducer. If the doctor can keep up the baby's weight and satisfy his appetite with complementary feeding, and give the mother confident assurance of ultimate success, he can generally obviate the untoward influence of worry.

4. That she may eat whatever she pleases, within ordinary bounds of reason, provided it does not cause indigestion on her part. The baby will not be affected by what she eats.

5. That excessive amounts of milk, cocoa, beer, or even water, do not necessarily, or even usually, aid in improving either the quality or the quantity of milk produced. That such excesses, on the contrary, usually end in harm, by spoiling the good appetite so necessary to lactation, if not actually upsetting the digestion.

6. That, in general terms, the same regimen that produces health and strength and bodily well being produces milk.

7. That no special diet can greatly modify the chemical constituents of the milk. The best opinion today is emphatically agreed on this. Further, some authorities believe that quantity alone can be altered—that the quality is, in an overwhelming majority of cases, always good.

8. That a laboratory test of the character of the milk is never of any practical use. The only test that is worth while is the practical test as to its effect on the baby. If he is hungry, or is failing to gain, he should have complementary feedings until the breast supply becomes adequate, as shown by these two criteria.

9. That the milk never disappears beyond recall suddenly, say, within twenty-four or forty-eight hours. Such an apparent vanishing of lactation is always evanescent, if complementary feeding is instituted promptly. The temporary diminution of the milk secretion can in this way always be made up for, the baby be tided over, and an enforced weaning be done away with.

10. That the care of the nipples is a most important phase of the periods of later gestation and lactation. Where a mother has depressed nipples, it should begin a month or two before the birth of the baby; gentle manipulation for a few minutes daily will make these easy for the baby to manage. Cleanliness, hardening by the application of half strength alcohol, and protection by the employment of inch square bits of sterile waxed paper, are important aids in keeping the nipples fit. Bismuth and castor oil, equal parts, may be used for incipient

cracking. Many women find that their nipples will not stand the wear and tear incident to nursing a child on both breasts at each feeding. Nursing on alternate breasts is usually advisable. However, as early milk is thin and watery, compared with later milk, which is richer, or strippings, which are very high in fat, we may if we wish diminish the fat content of what we are offering the baby by allowing him a shorter period at each of the two breasts at one feeding. As he fails thus to empty the breasts completely, we must be on the lookout, in such cases, for a reduction in the milk supply.

11. That we know of but two galactagogues. One is the stimulation of the infant suckling at the nipple. The other is the complete emptying of the breast at each nursing. These can be temporarily simulated; the first, by the breast pump and nipple massage, the second, by the breast pump and manual stripping of the breast, preferably after the manner described by Moore, of Portland (1). But the best agency of all is the one that combines the two, namely, the nursing baby.

12. That milk is like the manna that the Lord provided for the children of Israel: it cannot be stored up in the breast nor saved there for future use. A thorough understanding of this will do away with that bane of the doctor who is trying to improve a breast supply, namely, the alternate feeding of breast and bottle (supplementary feeding proper). This is frequently indulged in on the mistaken supposition on the part of the mother or her friends that there is not enough milk for all the feedings, and that in this way it can be eked out. Lacteal glands, like muscle tissue, work better the more they are called upon to perform, within physiological limits. The surest way in which to dry up a breast supply is to skip several feedings a day.

There seems to be no reasonable doubt that a moderate amount of breast milk does remove the disadvantage of the bottle feeding. Whether it is a question of carrying over antibodies from the mother to the baby, or whether it is a question of vitamins, or whatever the cause, we know that the child on complementary feedings shares much of the good fortune of the entirely breast fed infant. Then, too, after weeks or perhaps even months, the breast may begin to function to such an extent as to render further artificial feeding unnecessary, either temporarily or until weaning time. Such a simple solution as this, of a feeding problem, never offers itself unasked, in the case of the entirely bottle fed baby.

A fair degree of familiarity on the part of the attending physician with some comparatively simple form of infant feeding procedure to employ for the complementary feeding is, of course, necessary. Surely, however, this is not too much to ask of any man who is dealing as extensively with women and children as is the general practitioner.

And so, back we come to the favorite topic of pediatricists, infant feeding. The practitioners (and they are not few) who refuse to admit that there is such a specialty as pediatrics, taunt us with the gibe that every pediatric meeting, whatever its announced topic, either starts out or ends up with a

fuss over infant feeding. If a personal experience is allowable, I confess that after years in hospital and clinic work with children, it is still with fear and trembling that I approach an ordinary feeding case; and it is largely a matter of chance what feeding mixture such a new case would receive at my hands. I felt convinced that the old, complicated methods on which, *pediatrically speaking*, I had been brought up, were somehow wrong; and yet I did not know what was right. My feeling of dissatisfaction with the old methods may perhaps best be expressed by an illustration from life. If the operation of a trolley car were such a delicate, complicated matter that no one but an Edison could compass it, and you needed fifty trolley cars to handle the traffic of your city, then you will agree with me that the trolley car, as a means of handling your traction needs, would fail as a working, practical proposition. For there are not enough Edisons available to go around. Similarly, if it takes a Holt, a Morse, or a Kerley to feed your baby and mine, Mrs. Jones's and Mrs. Brown's, then infant feeding as taught today, in the East at least, is a failure. But we know that it is by no means as rare an occurrence as we could wish, to have a mother bring back to us, after two or three months' absence, a big fat baby that we have failed to make gain on the most scientific formulæ, with the triumphant remark, "Oh, Doctor, see what Blank's Food did for my baby!" Not pleasant, is it? Nor yet, as sometimes has happened to the best of us, to have Grandma's mixtures preferred by an ungrateful child to our elaborate formulæ! Such occurrences compel serious consideration.

The first step that I would urge in the simplifying of infant feeding, then, would be to keep every baby on the breast. I grant you at once that such a dictum as this, solemnly enunciated without further amplification, would constitute at once an insult to your intelligence, and an admission of my ignorance of the state of medical knowledge today. I should not have the effrontery to urge upon any body of physicians—much less upon a group of men engaged wholly with the problems of infancy and childhood—the already universally acknowledged superiority of breast feeding over the best of artificial feeding. This has been so generally conceded, and the literature has been piled so high with reports, experiences, statistics, and conclusions, to this effect, that it would be a waste of time to try to find anyone who would oppose what has come to be considered almost an axiom of pediatric practice. What I do want to stress, however, is the disparity existing between our theory and our practice in this regard. What I do want to plead for is the realization, first upon the part of the individual practitioner and through him upon the individual mother, that what both know and concede to be true in the great mass of cases, is in all probability true in the individual case that they are considering, and whose weaning they are proposing. No one ever states that bottle feeding in the abstract is better than breast feeding. It is only when we urge a mother to keep her own baby on the breast, even at the expense of some pains and effort on her part and ours, that we meet with any opposition

to the continuance of breast feeding. And we certainly do meet with it, as every one of you will testify with me.

Some time ago my attention was called to what was to me an interesting attempt to join the two systems, namely, the percentage and the caloric ideas of infant feeding. I believe that Dennett (2) has done more than anyone else to popularize this union in a workable technic. In order to fulfill the requirements that we set for ourselves in naming this investigation, we must produce something that is really simplified. It must be, not a head splitting, arithmetical jumble of proteins, carbohydrates, fats, and calories, but a simple, straightforward rule of thumb working system.

The part in our scheme that the percentage method is to play, was to determine how best to make our mixture digestible—a matter that the so-called caloric method never attempted to help us with. This simple point Chapin absolutely disregards in his diatribes against calories, in which he attempts to reduce the whole idea to the ridiculous by suggesting that we furnish the necessary calories to the youngster in the form of coal oil.

Without getting ourselves into the usual arithmetical tangle by comparing the percentages of the three food elements in human milk and in cow's milk, let us recognize that there are three elements that may under certain conditions give us trouble in adapting the milk of the cow to the stomach of the human—namely, fat, sugar, and protein. We will disregard the salts, about which we know as yet so painfully little. Let us dispose of the danger due to the fat by reducing it to a very low amount, by diluting ordinary cow's milk with twice as much water, i. e., one third milk and two thirds water. This same process will reduce the harmful potentialities of the sugar by reducing it so far that we shall later add sugar to our mixture in order to have enough to approximate it to the human norm. The protein can be disposed of even more simply by subjecting the diluted milk to a boiling process for three minutes, which completely breaks up the curd when acted upon by the stomach juices, as has been conclusively demonstrated by Brennehan, of Chicago, in his classic work on boiling milk. That the protein of the milk is "the cause of many of the nutritional disorders encountered in infancy" is categorically denied by Grulee (6). He is sure that the so-called casein curds are only mechanically irritant, and that this source of trouble is eliminated by boiling. The only possible objection to this, that it may cause scurvy in time, is done away with by the feeding of orange juice.

If we agree to start any child that comes to us on a mixture of one part cow's milk and two parts water, boiled together for three minutes, with no sugar added, we shall at least be giving a mixture that can do no harm. For the fat is diluted far below the amount found in human milk, the sugar is almost absent, and the casein, the protein constituent, has been rendered harmless by boiling, so that it will form a finely divided curd when it meets with the digestive juices of the infant's stomach. Any possible ill effect of the boiled milk we shall eliminate by feeding a little orange juice once or

twice a day. If we start with ten ounces of milk and twenty ounces of water, this will probably be insufficient. We can prove this by multiplying ten, the number of ounces of milk, by twenty, the number of calories in an ounce of milk, the water having no caloric value. This, our initial formula which we agree is digestible, is worth two hundred digestible calories. While it is much better to give too little of a digestible food than to give any amount of an indigestible one, if we are to look for a gain we must eventually come up to the digestive requirements which is best measured in calories. How are we to ascertain what the caloric need is? By multiplying the number of pounds the baby weighs by fifty, which is an average calculation of the requirements of the average child for each pound each day, we shall arrive at the number of calories that we must eventually give the baby in assimilable form. Starting with our trial or initial formula of ten ounces of milk and twenty ounces of water, worth two hundred calories, we may gradually strengthen this until we have brought it up to the number of calories that we have determined upon as a normal daily feeding for the baby. Our strengthening must be in terms of two factors only, namely, milk with twenty calories to the ounce, and sugar, with thirty calories to the level tablespoonful, five level tablespoonfuls, or 150 calories, may be taken more or less arbitrarily as the total sugar content at which to aim. This mixture is probably better borne in the form of dextrimaltose than in that of either cane sugar or milk sugar. In order to decide how many ounces of milk we shall eventually give our baby, we may subtract 150, the number of calories to be contributed by our five level tablespoonfuls of sugar from the total number of calories previously determined upon (by multiplying the number of pounds the baby weighs by fifty, his daily requirement to the pound). This total, divided by twenty (the number of calories to the ounce of milk), gives the ounces of milk needed.

This leaves us nothing more to determine but the amount of water to be used in the final total feeding. In order to do this, we shall simply have to determine the total bulk to be given the baby in the course of the day, which will be the number of bottles to be given, times the number of ounces in each bottle, determined by any rule that you have been using in the past. A general average might be represented by seven (which gives bottles enough for a feeding every three hours during the day, and one night feeding), times three, four, five, six, or seven, the number of ounces to the bottle, according to the age of the child. This bulk must be furnished by the water plus the milk, as the sugar goes into solution. As the number of ounces of milk required has previously been determined, we need only add water to bring up the total to the total bulk desired.

Now we need not aspire to reach this desired haven of the optimum number of calories at a bound. Grant that our baby may, and probably will, be hungry long before we have advanced him from the ten ounces of milk and twenty ounces of water, on which we started him, to the optimum formula that we have decided he must ultimately

reach. But all of us are committed to the principle of making haste slowly, in feeding babies, and at least we do away with the formerly commonly accepted twenty-four hour starvation period. The hungry baby worries the mother with his crying, but the child that worries the doctor is the baby that has no appetite.

Leaving all theory aside, the practice is this: Start virtually every baby on a mixture of ten ounces of milk and twenty ounces of water, boiled together for three minutes, with no sugar added. The caloric value of this is 10×20 , or 200. Experience will tell you when it is safe and advisable either to give a stronger mixture or a greater bulk at the start for this trial formula, as we may call it. With this weak strength and small amount, the preliminary starvation period, that we all used to insist upon, has been found quite unnecessary and a loss of valuable time, in most straight feeding cases. Add an ounce of milk a day. In this way the caloric value increases twenty a day. Add a level tablespoonful of sugar (preferably in the form of a malt sugar) gradually, every few days, in place of the increase in the milk, computing the value of the food on those days by adding thirty calories for each level tablespoonful of sugar added, instead of the twenty that would have been added by the addition of an ounce of milk. Five level tablespoonfuls of sugar is a good average quantity to aim at. In order to determine whether water should be increased, left as it is, or decreased, we must know how much bulk we want our baby to have in the twenty-four hours. This is easily arrived at by multiplying the number of feedings (say six or seven) by the number of ounces the baby is to receive at each feeding (which averages an ounce a month—more in the early months, of course, and less in the later). The difference between this total and the number of ounces of milk will represent the amount of water needed—as the sugar dissolves and so occupies no bulk. Before long, the juice of half an orange a day may be added.

The question of the best interval at which to feed is a point which is variously settled by different schools. My own custom has been largely the result of the method described by the homely phrase "cut and try." The two hour interval I use only in the case of premature babies; and the two and a half hour interval only as a step or half way stop in the course of changing from the two hour interval on which a baby may be when first seen, to the three hour interval at which I always prefer to start. As soon as the baby is doing perfectly well on this—by which we understand that he is being fed at 6 a. m., 9 a. m., 12 m., and 3, 6, and 10 p. m., and once during the night—and seems perfectly satisfied to wait from one feeding to another, and occasionally sleep till well along toward morning, I advise the mother to dispense with the night feeding, by giving first water when the baby wakes and cries, and finally omitting both nursing and water. This is the routine for babies who are not seen at birth; such babies do not receive any night feeding at all, being given warm water at two o'clock or later if they wake, which they soon cease to do. As early as the end of the first month, I

suggest to the mother that she will probably find it easier for both the baby and herself if she can change over to the four hour interval. If the idea appeals to her, I have her allow the baby to remain as long as he will from feeding to feeding—three and a half hours if he will not remain four hours—for about a week. Before the end of that time, a well fed baby is usually established on the four hour schedule. The same free and easy method is used at the age of three or four months, if the baby is satisfied and the mother cares to try omitting the 10 p. m. feeding. These changes are so much easier for the mother, and involve so much less handling of the baby, that it is usually easy to persuade the mother. It is hardly worth insisting upon, however; and is especially contraindicated if the baby is hungry, and ready for the bottle at the end of the three hour interval.

A most valuable adjunct to employ at times in the management of difficult cases is that much talked of agent, dry milk. Like most other proprietary preparations, it has its very definite dangers, in its likelihood to become a very intolerant master, as soon as it gains a place in the minds of the laity. In the child who has suffered a food injury, it is often a valuable aid, with the lowered fat content that at least one brand offers, and the apparently increased adaptability conferred by the heating process. If one has reason to doubt either the intelligence of the zeal of the one who is to prepare the complementary food, this is an efficient and valuable ally. Its caloric value is given as sixteen calories to the level tablespoonful.

A word as to the management of premature infants, in order to cover the various phases of the feeding of the first year of life. It is coming to be realized more and more that it is a waste of time—nay, of human life—to attempt the feeding of the premature infant with anything other than human breast milk, either whole or diluted. Strengths and intervals may well be left to the individual feeding the individual case. I am persuaded that the obtaining of the tiny amount of breast milk needed for the first days and weeks of the life of the premature infant, is by no means the difficult or impossible matter that we are likely to believe. That community must be a tiny one, indeed, in which there is at any one time but one nursing baby. And it should be most rare to fail to find a mother who, if the need were fully and carefully explained to her, would be glad to spare the few drops necessary to save the life of the starving baby. In the larger community it is easier; in the hospital, comparatively simple. Cooperation between the obstetricians and the pediatricists has in more than one instance resulted in the establishment of some central agency, at which the parents of the infant whose need for human milk is urgent, can be put in touch with the mother who is willing to supply, on a financial basis, a stated amount of breast milk a day. A more interesting method has been the feeding of the premature infant by means of a pipette or Bredl feeder, with a diluted breast milk expressed from a mother in the maternity ward, while the supply of its own mother was started by placing to her

breast a needy baby from the pediatric ward, who greatly benefits by the operation, until the premature baby can get its supply direct, by nursing at its own mother's breast.

Weaning is a procedure which entails no suffering on the part of the mother or child, since the brutal old custom of abrupt weaning was done away with. At about the sixth month, the mother is told to precede each breast feeding with a tablespoonful or two of a cereal. As soon thereafter as one wishes, the vegetables may be added, one by one, as baked potato with milk, spinach, carrots, mashed peas and beans. As these additional articles are judiciously used to expand the baby's dietary, it will naturally become less and less dependent upon the breast milk, which, toward the end of the nursing period, it will be using more as a beverage than as a sole dependence for nourishment. Milk, either diluted, and without sugar, or straight, may be added as desired. In this way, the change from breast feeding to general diet is made so gradual as to be almost imperceptible. It is only fair, in this connection, to mention the paper in which Morse, of Boston, sums up very fairly his objections to this procedure, and his reasons for adhering more strictly to the older custom of introducing these articles of diet considerably later. The change can be made as gradually from the four hour feeding intervals to the more conventional hours of meal times. The six o'clock feeding becomes a seven o'clock breakfast with cereal, milk, orange juice, and bread. The ten o'clock feeding becomes the prenap lunch of crackers and milk. The two o'clock feeding is easily recognized in the afternap dinner, with baked potato and milk, one other vegetable, bread or toast or zwieback, and a simple pudding. The six o'clock feeding is less deeply camouflaged, appearing as supper, with crackers and milk, and stewed fruit. The omission of eggs in any form, and of the elaborately prepared beef broth or scraped beef, is intentional. The value of the former is more than problematical; the labor spent on the latter is out of all proportion to its value, which has undoubtedly been greatly exaggerated.

I have tried to give you my articles of faith with regard to the management of the feeding of the ordinary baby—one that approximates the ordinary. (For no mother will ever admit that her baby could be classed as ordinary, by the dullest imagination.) Endless variations from the average may be made, to suit the individual baby, and to increase its flexibility in the hands of the individual infant feeder. A necessary part of the technic, in actual practice, that I have not attempted to bring out, consists in the rendering of frequent reports and maintaining constant touch between mother and doctor. This is absolutely essential, for checking up results, to see if directions are being carried out, and to detect and correct errors arising from a misunderstanding of directions. (In my own case, this is covered by the morning telephone consultation hour, at which time mothers are encouraged to telephone in reports and questions, with absolute freedom.)

Some such technic, flexibly and humanly applied,

that may easily be taught to any man who has to deal with babies, will carry perhaps ninety-five per cent. of our babies safely through the first, or critical, year of life. If this is true, and I believe that a large number of men might easily be found whose experience will confirm it, we may reasonably leave the remaining five per cent. or less to be discussed in some more highly technical treatise than I have attempted here.

SUMMARY.

1. Infant feeding, as taught until recently in the schools, urgently needs simplification.
2. The first step in simplification, and the most important for the welfare of the race in the future, is the maintenance of breast feeding, partial or complete, in the majority of our babies.
3. Such a statement alone is inadequate. Proof of the assertion, as well as help to the mother in accomplishing it, are needed. This consists in the adjustment, as I like to call it, of the breast to the baby, or the baby to the breast.
4. I have attempted to show how any man may keep that wonderful ally, Nature, on his side, and in many cases, take all the credit while he allows her to do most or all of the work.
5. To do this, requires a reasonable familiarity with some reasonably simple form of infant feeding procedure, for use in connection with the breast feeding, at some time during the period of lactation. I have tried to formulate the simplest that I have yet found.
6. A useful servant, but one that must be watched lest it assume the mastership, is some form of dry milk.
7. The successful care of any goodly proportion of premature babies presupposes the employment of breast milk in all cases.
8. Breast milk is not the rare thing we like to consider it—we can get it for the premature infant, if we go after it.
9. Weaning is a gradual affair—as such it may be accomplished without disagreeable effect upon either mother or child, if it is begun early enough.

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THE IMPORTANCE OF THE MICROSCOPICAL EXAMINATION OF HUMAN MILK.

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Considerable work has been done on the chemical, microscopical and bacteriological examination of cow's milk. Experimentation on human milk has, unfortunately, been mainly confined to its chemical examination, inasmuch as the latter determination has been found of great value in solving many problems of infant feeding. But in attempting to see whether a product is being furnished that may be regarded as fit, from a chemical viewpoint, many pediatricists and physicians overlook the fact that preparations are being administered to children that, in many instances, are detrimental to their health. It is with this fact in mind that I always advise a careful microscopical examination in addition to the general routine chemical examination.

It is difficult to formulate standards for cow's milk, due to the fact that many questions are to be considered. The farmer is interested in milk production so as to secure a reasonable financial return. The same is probably true in regard to all others who handle and sell this product. The sanitariat and the consumer, however, consider the milk problem only from the point of view of its effect on the health of those who use it. It is, therefore, apparent that the question of formulating standards on cow's milk with as little discrepancies as possible, is one which will be open, to a greater or less extent, to misunderstandings, due to the fact that many phases of the whole problem must be taken into consideration. Such is, however, not the case with human milk. For here, after all, no problems are encountered as are observed in cow's milk, and its effect on the health of the child is the only question to be considered.

SOURCES OF BACTERIA IN HUMAN MILK.

There is no doubt in my mind that human milk is rarely, if ever, bacteria free. Specimens that were collected under the most favorable conditions showed the presence of bacteria. This is not due to the fact that the healthy milk gland does not secrete a sterile product, but mainly for the reason that bacteria probably find their way through the nipples and other sources. Furthermore, there is little cause for arguing this question, for, after all, whether milk secreted by the milk glands is or is not germ free, it is a known fact that the milk at the time it is taken by the child, contains bacteria.

The bacteria of the healthy mammary glands form but a small porportion of the total bacterial content in milk consumed during nursing. The skin of the mother, directly or indirectly, through clothing, handling, etc., contributes the abundant quantity of bacteria found in human milk and fed to the child. Within the last four months two hemolytic streptococci infections in nursing infants were traced by me to human milk. In both cases, the physical examination of the mammary glands of the mother by the attending physician showed no inflammation,

and the microscopical examination of the milk did not show any abnormal quantity of pus cells or cellular matter. It is, therefore, more than probable that these microorganisms found their way into the milk from the skin of the mother. How many pediatricists and physicians advise the cleansing, washing, or merely wiping with a wet cloth, of the nipple and surrounding area, before nursing? And how many mothers actually take such precaution?

In six different samples of human milk, collected under conditions almost identical with actual conditions at the time an infant is about to begin nursing, after a careful bacteriological examination I found only two of the samples of such a bacterial count as to regard it fit for consumption. The other four had a bacterial count ranging between 1,110,000 to 4,260,000 to the c. c. In the case of cow's milk, we hear of the cleansing of the skin of the cows, the hands of the milker, the vessels used for collection, and other implements. Why not observe precautions of cleanliness in the case of human milk?

It cannot be pointed out too frequently, that the excessive bacterial contamination in human milk is not only avoidable, but unnecessary. It can be prevented to a large degree by closely guarding the simple rules of cleanliness. This involves no increase in expense. It usually means less suffering, little or no worry, and, if anything, a decrease in expense in the long run. The time may come that the science of bacteriology will develop to an even greater exactness than it is today, and the direct relationship between many of the diseases of children may be traced to mother's milk, contaminated carelessly from the skin.

In addition to the previously outlined sources of contamination, there may be another: that is, from a diseased mammary gland. The latter, when diseased to such an extent that a physical diagnosis reveals the fact, quickly places the attending physician on his guard. But it is those diseased conditions, wherein the mother apparently feels no discomfort, and where, nevertheless, an inflammation (or mastitis) exists, which produce a serious source of danger.

It has been my privilege to examine numerous specimens of human milk, which, though the chemical analyses showed perfect samples, the microscopical observations, however, revealed the fact that they were highly contaminated with bacteria, lymphocytes, polymorphonuclear leucocytes, epithelial cells, and other cellular matter. In most of these instances, the mother felt no discomfort, while the nursing infant showed little or no progress. In many of them various diseased conditions prevailed. This was afterward found to be caused by the use of contaminated milk. It is almost impossible to attempt to tabulate my findings in the many samples mentioned. In the first place, a total bacterial count was made only when asked for by the physician and experimentally in the few instances reported. A microscopical examination was, however, made on every sample. The Stokes method was used, a smear being made from the fat layer as well as from the centrifugalized sediment. In many of the instances a quantitative estimation of the leucocytes was made, the Doane Buckley method

(as reported by them in 1910 before the laboratory section of the American Public Health Association) being used. The epidemiological connection between various attacks of illness in children and the use of the milk of mothers suffering from diseased mammary glands (not observable by a physical diagnosis) is not altogether clear, and the causative agents (i. e., types of microorganisms or toxins) concerned therein are still obscure.

Little work has been done in regard to the occurrence of pathogenic and nonpathogenic bacteria in human milk, whether found naturally or through contamination. The occurrence of disease producing bacteria have been reported by some workers every now and then. To attempt and formulate standards is not an easy task, for anyone familiar with analyses of breast milk is aware of the existence of wide variations in chemical and bacterial compositions not only in samples from different individuals but also in portions obtained from the same sample at different intervals. The structure of the mammary glands and their mechanism of secretion, together with the histological changes taking place during the periods of lactation, are familiar to all. The chemical examination of milk and the methods of correcting a faulty chemical composition have been studied thoroughly and considerable data are available, from which valuable information can be obtained. But the literature pertaining to the microscopical and bacteriological examination of human milk is far from complete, and the little that is available is uncertain. A more direct recognition of infectious diseases traceable to breast milk, obtained from a diseased mammary gland or introduced through other infectious human material, is still to be produced by a close and thorough scientific study. Most of the information available is merely assumed and an exact degree of danger from this source is needed.

This short exposition is the outgrowth of my personal observation. The subject is of the greatest importance and it is my belief that one of the most pressing needs of the present time is a more thorough investigation into the relationship of human milk and the nursing infant, from microscopical and bacteriological viewpoints.

1831 CHESTNUT STREET.

XERODERMA PIGMENTOSUM.*

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This disease was unknown until 1870, when Kaposi (1) described it with a report of four patients. Three years later he reported briefly and tabulated thirty-eight cases. Since that time over eighty-five cases have been reported. Many observers regard this condition as an aggravated form and sequel of common lentigenes; others regard it as potentially a malignant disease. It usually develops in early life (in the present case the mother asserts that the pigmentation was present at birth), and is characterized by overgrowth of pigmented

epithelium, especially on the exposed surfaces, as the face, scalp, neck, upper shoulders, hands, and forearms. In our case the scalp was not nearly as much affected as were the other exposed surfaces.

The pigmentation is always more marked in the summer, and may disappear for one or two winters, when it finally remains. Shortly afterward telangiectasis and atrophic white spots appear, giving the skin a scarred character similar to that seen after long x ray exposure. According to Dalous and Constantin (2), they are the most marked features of xeroderma. The cicatricial like areas are smooth, shiny, and wrinkle very much as does the senile skin. There is a tendency toward the coalescence of these areas. The sensibility of the atrophic areas becomes lessened, and glandular secretion is not so active.



FIG. 1.—Patient, H. M., in author's case of xeroderma pigmentosum.

The skin becomes darker, which, on close examination, is seen to be due to the excessive freckling.

The disease may continue for months or even years, in this apparently benign character, but sooner or later more pathological characteristics become apparent. Wartlike growths appear, which are overgrowths of the lentiginous spots. As in our case, ectropion, blepharitis, conjunctivitis, and even ulcerative keratitis are likely to occur. There need be no dependence of one lesion upon the other, however, according to Kaposi, the lentiginous areas become telangiectatic, later scaly, and finally there is atrophy of the affected skin. Crocker (3) has reported a case in which the disease remained quiescent for about six years, but as a rule there is

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a gradual progression, so that sooner or later to the symptom complex is added the appearance of ulcerating tumorlike processes, malignant in character, belonging to the epitheliomatous or sarcomatous group. This is the time at which the malady becomes a grave one. Kreibich, Pernet, and Halle (4 and 5) say the epitheliomata may be of the type of acanthoma or of rodent ulcer type, while Unna finds that they are often pigmented as in sailor's carcinoma. The case which we are reporting is similar to those described by Hutchinson (6) as *lentigo maligna juvenalis, v. senilis*, in that his cases of progressive freckles of the cheek and eyelid became the seat of epithelioma.

The disease is usually confined to the skin or mucocutaneous junctions, the internal organs rarely becoming involved. Death does not usually occur until many years after the lesions appear, and is



FIG. 2.—Same patient as in Fig. 1, after treatment.

due to the exhaustion from pain and the effect of the malignant ulcerative lesions. In exceptional cases the disease becomes stationary after a number of years.

The etiology is not established. Councilman (7), Magrath (8), and Corbett (9), think the exciting cause is exposure to sunlight acting on the skin of congenitally and constitutionally predisposed subjects. On account of the behavior of the disease and its occurrences in two or three members of a family, Rouviere (10), White (11), Brayton (12), and Rüder have suggested a parasitic etiology, but this has not been substantiated. Kaposi believed it due to a congenital formative and nutritive anomaly of the vascular and pigmented portions of the papillary layer of the skin. Recently a number of these cases with epitheliomatous change have been reported by G. W. Grier (13) as being treated with x ray with very good results.

CASE.—H. M., aged nine, was admitted to the service of Dr. G. P. Müller and Dr. J. P. Crozer Griffith, University Hospital, January 30, 1920, the chief complaint being a sore on the nose. The mother said that the child was slightly pigmented at birth, but this became very much exaggerated about six weeks later. It was associated, according to the mother, with an eczema, which was characterized by oozing and scaling. The pigmentation increased with each succeeding year. It was especially marked during the summer months, when the skin became very red, and this was also the case when the child was exposed to an excessive wind. In August, 1919, the patient noticed a small papule, wartlike in character, about the size of a pea, on the bridge of the nose. It was very hard and, according to the mother, the top was black. It enlarged very rapidly, but never ulcerated or bled. At first there was very little pain, but this increased as the tumor enlarged. On December 27th she entered one of the state hospitals, where the tumor was cauterized. There was a rapid recurrence which gradually extended along the lower margin of the left eyelid. The mass bled now very freely.

The physical examination showed a fairly well nourished child about nine years old. The scalp appeared scaly and was pigmented. There was a marked injection of both conjunctiva with a marginal blepharitis. The left lower lid was ulcerated, the ulceration being continuous with the fungating mass over the bridge of the nose. This mass was about the size of half a dollar, and was craterlike in character. The skin, especially that of the face, neck, hands, forearms, and upper part of the chest and back, resembled that of a very old individual, there being numerous leucodermic areas interspersed between the areas of deep pigmentation. The skin over these areas was smooth, shiny, and wrinkled very easily. It resembled the skin of those who have been subjected to prolonged x ray exposure. The pigmentation was most marked on the back of the neck, the dorsum of the hands, and the face. There was a pigmentation, with ulceration of the mucous membrane of the lips and inside the mouth. The mass on the nose was fulgurated, as was the growth on the lower eyelid. One week later the patient was treated with fifty mgms. of radium for four hours. When last heard from, in March, 1920, the patient had not improved.

The pathological report, from the Laboratory of Dermatological Research, presented by Dr. Weidman, was as follows:

Slide No. 1: Showed none of the histology of skin, but consisted of closely placed large squamous cells with broad markedly coalescent cytoplasm and large but pale nuclei. There was no good pearl formation, although from time to time there were sufficient small concentric arrangements of keratin to distinctly indicate an attempt thereat. Small foci of lymphocytes occurring around small blood vessels were the only things left to indicate the original fibrous stroma of the parts invaded. The extreme disorderly arrangement of the squamous cells and their highly atypical and hyperchromatic nuclei could leave no doubt of the squamous carcinomatous nature of this disease.

Slide No. 2: This time the surface epiderm was shown over one side of section. All of the layers were represented. Interpapillary pegs were markedly elongated, broadened, irregular in form, and extended deeply into the underlying corium. At opposite end of section the epiderm dipped downward, and became continuous with a large mass of squamous epithelial cells which were arranged in the classical and characteristic fashion of squamous cell carcinoma of the prickle cell type. The underlying corium was practically entirely occupied by the tumor elements in this section. They were arranged in the usual interlacing intercommunicating trabecular fashion with extensive permeation of lymphatics, and showed exquisite examples of pearly body formation. At the more peripheral borders the stroma was heavily infiltrated with lymphocytes.

Summary of microscopical description of skin from back of neck: A marked hyperpigmentation of rete cells, occurring irregularly as to intensity along different stretches of the freckle. There was a little irregularity of interpapillary pegs and in one place a slight exfoliation of epiderm in the floor of a surface pocket. The chromatophores of the corium were also a little more conspicuous than normal. Intradermal fat was noted.

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EMPHYEMA IN CHILDREN.

Report of Sixty-four Consecutive Cases.*

BY ELIZABETH GLENN, A. B., M. D.,
Philadelphia.

Empyema in children is a very interesting subject. The statistics given below are those of the Children's Service of the University Hospital since 1907:

Discharged, cured, twenty-four; discharged, improved, twenty-eight; died, twelve; total, sixty-four. Length of stay in hospital, under one month, twenty-two; under two months, twenty-four; over two months, six.

It is interesting to note that the mortality in these children, all of whom were under twelve years of age, was only 18.7 per cent., while the average adult mortality ranges from twenty per cent. up.

*From the Children's Service of the University Hospital. Reported through the courtesy of Dr. J. P. Crozer Griffith and the Surgical Service.

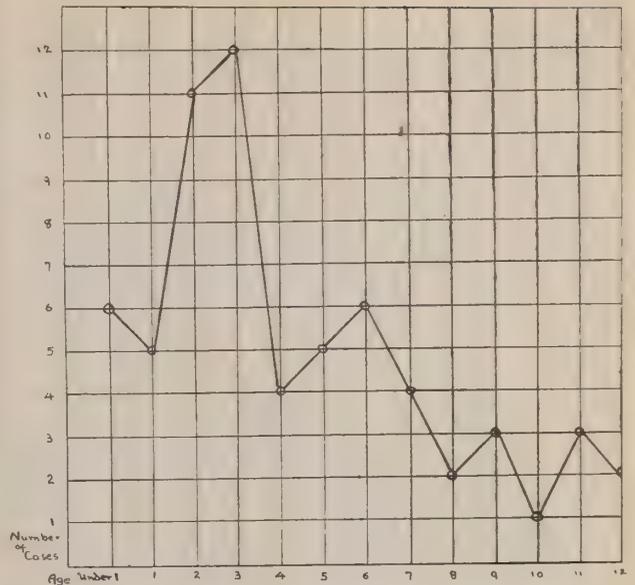


Chart showing mortality from empyema in sixty-four cases.

AGE INCIDENCE AND MORTALITY BY AGE.

Age	No. of cases	No. of deaths
Under 1 year.....	6	4
1 year	5	2
2 years	11	2
3 years	12	1
4 years	4	
5 years	5	
6 years	6	2
7 years	4	
8 years	2	
9 years	3	
10 years	1	
11 years	3	1
12 years	2	

This may be partly due to the fact that many of these cases were admitted to Dr. Griffith's service with a primary pneumonia, the empyema developing in the hospital. Surgical intervention was, therefore, prompt. Thirty-seven rib resections were done, with six deaths; twenty-seven thoracotomies, with six deaths.

Another fact worthy of note is the preponderance of leftsided empyemas in children. In thirty-four of our cases there was leftsided involvement, in twenty-three rightsided involvements, and in seven the histories are deficient in stating the location. Two of the empyemas originated on the left side and involved the right side secondarily. Both of these patients died. There is also a marked preponderance of males, there being over twice as many males as females. These admissions were to a ward where no distinction is made as to sex in admissions. There were forty-four males and twenty females.

The great majority of these cases were post-pneumonic, fifty-four being due to this cause. Of the two tuberculous empyemas, one did not recur after drainage. The primary infections were as follows: Pneumonia, one with typhoid, fifty-four; influenza, three; pulmonary tuberculosis, two; scarlet fever, one; unspecified, four.

Although the mortality usually given for empyema in children under one year is 100 per cent., in our series of six cases the mortality is only 66.6 per cent. If we subtract these six cases from our

total number of cases, the general mortality would be only 13.6 per cent. Of the twenty-three patients cured before discharge, eleven had been operated on in one week or less after the presence of pus was suspected, five more within two weeks of this time. The average length of stay in the hospital after operation of those operated on in less than a week from the onset was thirty-five days, while for those operated on one week later, it was forty-three days.

Conclusions must be drawn cautiously from a series of this number, but it is safe to conclude the following:

1. The incidence in males is greater than in females.
2. The left side is more often involved than the right.
3. If the mortality rate for empyema in children under one year is excluded, the death rate is lower in children than in adults.
4. In children under one year the mortality in our six cases was 66.6 per cent., instead of the 90 to 100 per cent. usually given.
5. In the postpneumonic empyemas, where the patient is operated on within the first week after onset, the average stay in the hospital was shorter and the proportion of cures higher than in those operated on at a later time.

THE WEAK FOOT IN THE CHILD.

Flexible Flat Foot.

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In an article of scientific interest, it is natural to expect a direct statement of fact, devoid of sensation or sentiment. I shall attempt to comply with this essential in presenting a few preliminary considerations that prove the common weak foot (or, as it is sometimes called, the flexible flat foot) in the child to be not only a medical paradox but also a national calamity. That it is a national calamity becomes evident from the fact that from sixty to seventy per cent. of the children, particularly in the metropolitan centres, are through numerous examinations found to be afflicted; in that the condition most often remains ingrown instead of outgrown; and because the weak foot too often becomes the forerunner to permanent postural defects, creating or enhancing other organ disorders and bringing with it economic inefficiency and often failure in later life. It is manifestly a medical paradox in that with the exception of the few orthopedists, who give the feet only incidental study and treatment, or of the few podiatrists, who treat the feet alone, there is no specific attention being paid by the medical profession to the development of a rational policy on this important phase of child welfare.

We need not travel far to obtain direct evidence. We observe the curious spectacle of thousands of children who actually required trained medical guidance being brought to the shoe store for diagnosis and treatment of foot trouble. The treatment gener-

ally takes the form of a brand shoe that is sold without understanding the actual need of the pathological instance at hand. Additional treatment often obtains in the further sale of commercial arch supports or archsupport shoes. It is amazing to note how lacking the agencies are to furnish reliable advice or treatment and to see how this deficiency

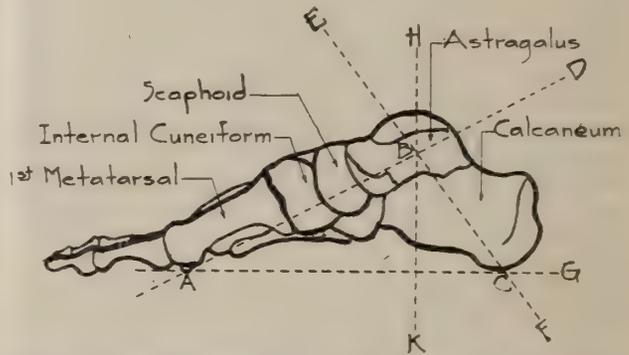


FIG. 1.—The foot viewed as an arch consisting of two pillars, line A-B and line B-C, with the astragalus as the keystone.

serves generally to confuse a frantic, foot sore and nervous populace in its search for advice.

A little thought shows this neglect to be such a serious detriment to child welfare as to make some action imperative. Parents should be instructed not to depend on shoe stores or stock arch supports for the cure of foot conditions. The results from such sources are too often such as almost to warrant legislative interference of some kind. I have in mind at the present writing several instances of tuberculous ankle joints and arthritides in the feet which, under the incentive of selling arch supports at a commission, were diagnosed in shoe stores as flat foot, and where accordingly valuable time was lost before the true state of affairs was made known at a hospital or in the practitioner's office. When occasion arises, parents should be cautioned to have the child's foot examined by the physician or specialist first as is done with the other organs. Periodical inspections of the feet of children in public institutions should be made a routine as for other body deficiencies. In treating a foot condition in the child, the general practitioner should be prepared, if he advises shoes or supports, to check these items in connection with his other treatment. The physician certainly does not leave the prescribing of medication to the druggist. Yet with feet, it is common to shift the responsibility to the shoe clerk, and the public has thus in time become accustomed to regard the shoe clerk's knowledge of feet as superior to that of the doctor and diagnosis as within the province of the shoe store. As a matter of fact, the shoe clerk cannot be prepared under the strain of making sales or by virtue of previous training to be the logical guardian of the child's foot. He is incapable of differentiating between cases of foot ailments of a localized nature and those ailments that reflect constitutional, nervous or mechanical disorders elsewhere in the body. This differentiation constitutes a prime requisite for the successful diagnosis and treatment of any foot condition. Further evidence of these facts is furnished by the histories of the thousands of patients who eventu-

ally arrive at the office of the practitioner or at some hospital for advice after having experimented many years with shoes and arches and where the disability again often finds its source elsewhere than in the feet.

Military authorities require those who care for the horse to have a preliminary knowledge of the anatomy and physiology of the locomotive apparatus of this animal. The shoeing of the horse is generally considered an art of the highest utility toward the preservation of the animal's efficiency, and this expert care is but natural and proper. The growing child, however, whose foot is not an incoordinate mass like the horse's hoof, and which is called upon for a greater delicacy of function as indicated in the grace and elasticity of the human gait, is recklessly relegated to such empirical factors as stores and arch support specialists. Thus the weaknesses are permitted to develop and create later disability. This situation might be ludicrous were not its outcome so serious. It is obvious that the attention and action of all agencies in caring for the child are thus challenged.

Incidentally, we see the general public depending upon corn cures for relief from excrescences that generally reflect a malposition of the delicate structures of the foot, which malposition occasions undue friction or pressure at the point where the excrescence occurs. Here it is again evident that minor orthopedic measures and scientific guidance are needed in preference to the much lauded proprietaries heralded as a cureall for foot ills.

So extensive is the effect of this neglect upon children that if legislation were enacted and rigidly enforced to prevent the diagnosis of foot ailments in shoe stores, or this legislation to permit such diagnosis only through the employment of a specialist, the community would thereby eliminate a potent factor in undermining the vital efficiency of present and future generations. This suggestion of medical specialists in stores may sound unusual; but a little thought proves it logical and essential. Experience has demonstrated the logic of this routine so far as the eye is concerned, as the leading optical concerns now employ oculists. The penalties for the neglect of foot ailments are certainly as exacting as for the neglect of the eye.

As to the increase and extensive prevalence of weak feet in children and the fact that the condition as hereafter explained more often remains in-

grown, we again have ready evidence. Institutional statistics are constantly making this fact plain. It was particularly brought to light with the great number of rejections from military service in the early recruiting for the late war and before an order was eventually issued to reject no more foot cases. On several occasions when I have examined groups of children for this ailment, the percentage of those who showed little or more advanced symptoms of this condition was about sixty. This percentage I find confirmed by those who have had occasion to make special examinations for the same ailment.

That the present attitude of the general public is in nowise likely to reduce this proportion of weak feet is very likely. There is a too frequent tendency to regard most pains where present as rheumatic or neurotic; or to depend, as mentioned, on shoes or supports as cures, or to be misled by a popular fallacy that pain in the lower extremities is of little consequence, will right itself and warrants no special attention. It is, however, to the credit of some of the more progressive shoe manufacturers and stores that the nature of shoe advertisements is assuming a different tone that would indicate a healthy awakening. Where formerly style and wear were featured in the advertisement,

these concerns are now directing attention to proper fitting and to general foot care in the child, and thus parents are being benefited. The neglect of the child's foot can hardly be blamed entirely on the parent, as it seems unlikely, assuming the latter to have been properly advised, that there should result a willful neglect of the child's feet to the detriment of a later economic efficiency and earning power, and which neglect might later bar the child from desirable positions in civil or military life.

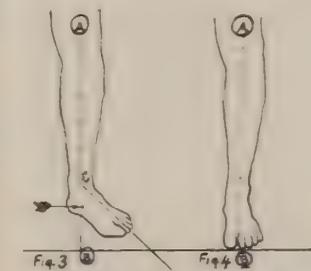


FIG. 3.—The incorrect attitude in standing or walking. Line of body weight A-B. Pressure through this line being concentrated at keystone region of arch as indicated by arrow. This attitude contradicts the leverage function of entire foot by diverting the muscular action from leg to foot. The consequent overstretching of the inner muscles and ligaments predisposes to an inward displacement of the pillars of the arch, particularly with prolonged standing characteristic of many common occupations.

FIG. 4.—The correct attitude in standing or walking. Leverage action of the foot facilitated by undiverted muscular action and the fact that body weight now falls over entire length of foot. The segments of the longitudinal arch are kept from falling inward by the direct action of muscles from leg to foot. (This attitude in marching would mean a gain of about one inch to the step as compared to attitude of Fig. 3 where about an inch is lost. In a march of about thirty miles with its average of 2000 steps to the mile, there would be a clear gain of about one mile, while the same thirty miles performed with the feet as in Fig. 3 would incur loss of a mile in distance).

me, as it seems plain that pliability of bone lends itself as much to natural distortion as to natural therapeutics, particularly where bones are meeting the pressure of body weight as in the case of the lower extremities. The extensive prevalence of flat

feet in the adult consequent so often to weak feet in the child proves that the condition of weak foot is not so readily outgrown as is generally thought.

The subject of weak foot (flexible flat foot) will be principally discussed from the viewpoint of a visible mechanical deformity, commonly seen in children, and irrespective of its prime etiology, existing as an end result of any one or more of a variety of causes herein-after enumerated.

The weak foot may be defined as a foot which in contour and action resembles a perfect foot until weight is borne on it as in standing when it assumes an attitude of deformity corresponding to flat foot, and as later detailed. The change under weight bearing is due to the inability of muscles and ligaments to maintain sufficient tension to hold the superimposed weight. The term weak foot or flexible flat foot is preferable to flat foot, the latter being restricted to the later fixed stage where the deformity is visible even with the foot off the ground. As with flat foot, the condition is generally found in both feet instead of one foot alone, though the term seems to imply an affection of one foot alone. The weak foot may be congenital; more often it appears to have been acquired through a variety of factors to be outlined.

As to congenital cases, I do not refer to the relatively infrequent congenital talipes valgus where there is some contraction of tissue and, therefore, resistance to manual correction, or to paralytic conditions. I have in mind the common form with unrestricted active or passive motion of the feet and which becomes apparent as soon as the child starts to stand and walk. If present before locomotion commences, it would seem difficult to identify the condition so as actually to class it as congenital. This must be so, because a weak foot is generally identified by a change of contour from the attitude of rest to that of standing. We cannot, however, get the infant in arms to stand for us. Even if the infant could stand unassisted, the additional adipose tissue under the child's arch, together with the lack of complete development of this arch (which can only occur consequent to muscular activity) would still make the diagnosis of a purely congenital case difficult if not impossible. Of course, in the relatively more rare cases of congenital talipes valgus, the deformity is visible even with the foot at rest.

Assuming, however, a case to be purely congenital, its prime etiology as with other congenital deformities remains speculative. It is impossible to

state definitely to what extent prenatal influences have contributed to the condition, or whether post-natal influences in the period before walking begins might not have been chiefly causative particularly with a history of defective assimilation.

When viewed, however, as an acquired condition, or when we observe the cases that are distinctly acquired, the etiology is more definitely assignable to a single or combined operation of any of the following: A too rapid growth or increase in weight; confinement by illness; sudden strain after such confinement; local tissue effects of certain illnesses themselves; improper support of the foot during prolonged confinement to bed; city pavements; commercial arch supports; improper attitudes in standing or walking; the distortion at the ankle induced by favoring a part, as with excrescences such as corns, callosities, or ingrowing nails; or as with sprains of the ankle joint; improper footwear. Among the relatively rarer causes which, though not bearing on the common weak foot under discussion, may be mentioned for completeness, are found: spasm of the peroneal muscles (spastic weak foot and really an inflexible form); genu valgum (knock knee), where the foot is forced into valgus by the outward swing of the legs which concentrates the weight of the body on the inner arch; paralytic talipes valgus; or accompanying the early

or rachitic type of genu varum (bow leg). The prime etiology, however, may nevertheless be obscure in those cases where, for example, we find weak feet that have developed in children who give no history of illness, pain or trauma, and who besides are light in weight and fairly muscular. An inquiry into the causes mentioned seems to indicate that, excluding disease, faulty nutrition and the like, two factors stand out prominently as being directly predisposing and which will be referred to seriatim. At least, no intelligent treatment of this condition can occur without primary attention to the elements of attitude and footwear.

ATTITUDE.

So far as the stability of the human foot or efficient gait is concerned, we have erred by teaching the child to toe out in standing or walking. To appreciate why turning the toes outward is decidedly antagonistic to good foot function, let us observe some anatomical peculiarities of interest and the arch itself. In Fig. 1, we see that this arch

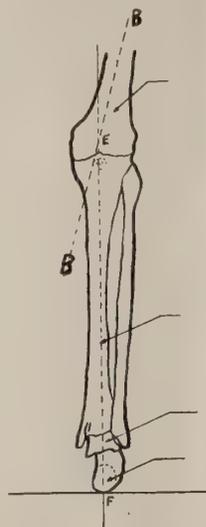


FIG. 5.—Posterior view of skeleton of right leg, showing the slight but normal knock-knee existing in the standing position due to inclination of femora from hips to knees. Line B-B shows approximate inclination of femur. Weak feet reflect themselves in an inward shift of the tibia, thus an approximation of the knee joints thereby with an increased tilting of the femora creating more or less secondary knock-knee. The reciprocal relationship between weak feet and knock-knees is thus evident.

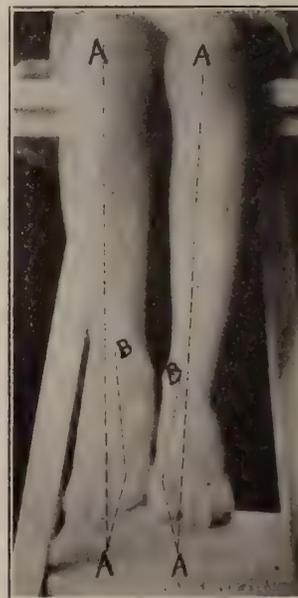


FIG. 6.—Normal feet at rest. This may also illustrate the weak feet at rest in which attitude no abnormality is ordinarily visible. Lines A-A pass about centrally through ankle joints as with the same normal feet standing in Figs. 7 and 8. Short dotted lines A-B in their angulation at the metatarso-phalangeal joints show how in the rest attitude, the large toes abduct from median line of body and lean over against the second toes.

may be conveniently referred to as consisting of two limbs, the os calcis, line B-C, forming the posterior and shorter limb, while the anterior segment, line A-B, is formed by the bones in front of the astragalus and which extends to the heads of the metatarsal bones, the astragalus itself forming

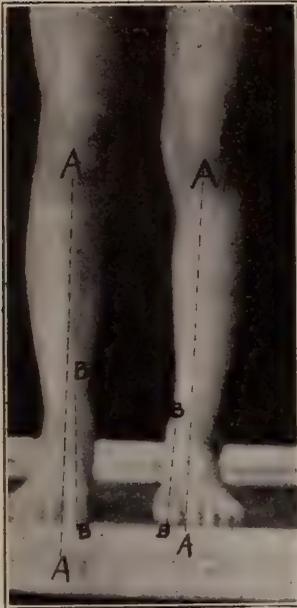


FIG. 7.



FIG. 8.

FIG. 7.—Anterior view of normal feet in standing position. Long dotted lines centralize through ankle and foot in contrast with the weak foot standing in Fig. 9. Short dotted lines B-B show in each case how large toe has now swung away from the second toe so as to point toward line of progress and bear body weight. A space is now evident between the first and second toes.

FIG. 8.—Posterior view of normal feet in standing position. Contrast (with respect to the ankle joint) the locus of this line in the weak foot standing, Fig. 10.

a sort of keystone and being the first structure to receive the direct body weight which is transmitted vertically through the tibia. The first anatomical peculiarity that is immediately apparent is concerned with the relationship of the bones of the foot, as shown in Fig. 2. Here we note that the os calcis as the posterior segment of the arch is not centralized under the weight bearing axis of the foot, line A-A, but that the greater part of its body is outside of such axis. We observe in addition that the greater area generally of the weight bearing foot is outside of this same axis. Now we should also bear in mind that in the normal standing attitude, the astragalus or keystone rolls slightly downward and inward on the os calcis until it, the tibia, the knee joint and the hip joint, are checked from inward dislocation by powerful muscular tension, and which muscles are principally located or act at the inner side of the entire leg. The muscles between the knee joint and the foot which directly keep the arch with the keystone intact by a combined tightening are the flexors of all the toes, and the peroneus longus which tend to flex the longitudinal segments of the arch; the tibialis anticus which by tension from its upper origin in leg has an adducting and inwardly rotating effect on the internal cuneiform and first metatarsal bones, thereby tending to invert the sole and to throw the weight of body on outer side of foot and thus less weight

on the inner or springy and more elastic side of foot; the tendon of the tibialis posticus which passes directly beneath the inferior calcaneoscaphoid ligament, on which ligament the head of the astragalus reclines; and in a lesser measure, this inferior calcaneoscaphoid or spring ligament extending from the inner surface of the os calcis to the scaphoid.

Thus the body is actually resting on an arched foundation that is not centralized beneath it, and with this there exists a normal tendency for the weight of the body to force inward the posterior segment or heel bone as a result of which the keystone or astragalus and its superimposed structures tend to slide in and off the foot in normal standing and more so, of course, in walking, which tendency receives a powerful muscular check. This check, however, can operate most efficiently if direct muscular action is not diverted as shown by the correct attitude in Fig. 4, instead of the incorrect one in Fig. 3. We see in the correct attitude how the muscles act directly in maintaining the arch and effecting graceful locomotion because the line of action through these muscles is a straight one and is not diverted by the break at point C of Fig. 3. We observe also that in the correct attitude, the direction of body weight, line A-B, continues as it should through the length of the weight bearing foot. In the incorrect attitude of Fig. 3, the weight of the body is, as shown by the arrow, concentrated against the keystone region of the arch instead of through the length of the foot and thus together with a diverted muscular play, the tendency of the ankle joint to roll inward is enhanced. In other words, in the incorrect attitude the greater area of the outer and normal weight bearing foot has been



FIG. 9.



FIG. 10.

FIG. 9.—Anterior view of weak foot (flexible flat foot) standing. Note displacement laterally of longitudinal arch with its secondary pronation at ankle joints. Thus this condition is often mistaken for so-called weak ankles.

FIG. 10.—Posterior view of weak foot (flexible flat foot) standing.

relieved of its share of work which is being added in weight at the very point in the arch that was intended mainly for elasticity, thus lessening the spring by this pressure of added weight. The incorrect attitude thus contradicts the normal action

of the various muscles referred to in preserving the integrity of the arch and general body balance and occasions mechanical strain. Such an attitude if maintained habitually helps to produce a weakening of the arch by an overstretching and relaxation of muscles and ligaments, and when accompanied by other factors that may weaken the general or local musculature, as overweight, overstrain, disease, and the like, can only result in a natural lateral and inward displacement of the component segments of the arch, lines A-B and B-C, Fig. 1, and which is the prime objective symptom of the weak foot hereinafter detailed.

It should not be assumed, however, that this muscular play against an arch that tends to fall inward means defective construction on the part of Nature. As a matter of fact, a midplay at the tarsal region is thus effected that makes for the grace and elasticity characteristic in man who, of all bipeds, carries his weight constantly on two feet with most remarkable ease. Besides this lateral midtarsal play is safer than a vertical up and down flexibility of the arch because of the danger entailed to the delicate plantar vessels and nerves by compression between the body and the ground if the arch could rock up and down. The needed vertical elasticity is sufficiently compensated by the ready flexibility of the knee joint itself. Thus where correct attitude is maintained, the muscular play is such as to amply offset what might otherwise be a mechanical difficulty.

An observation of the alignment at the knee and hip joints reveals another anatomical peculiarity that indicates a reciprocal relationship between weak feet and knock knees, explaining why both conditions invariably coexist, and which confirms the necessity for the attitude of Fig. 4. By reference to Fig. 5, showing the posterior skeletal view of the right leg standing, we see that the thigh bones incline inward toward the knees, which, in view of the proximity of the knees, must occur because the upper ends of the thighs at the hip joint are separated in standing by the normal breadth of the pelvis and the extended necks of the femora. The normal inclination of the femora is then inward to the knees, which really means that there already exists a normal amount of knock knee in the standing attitude, the knees tending to collide with any tendency acting from below that would throw the tibia and thus the knee joint inward. But here again, as with the tendency of the leg to roll in on the foot counteracted by muscular resistance, we have the muscles and ligaments in the upper leg and thigh counteracting (by tension and outward force) the knock knee tendency. This again is a natural provision for a useful lateral mobility of the limb, the necessary vertical flexibility being facilitated as stated by simple knee flexion. But the improper attitude shown in Fig. 3, which makes for the inward displacement of the arch by interfering with normal muscular tension, similarly diverts the direct action of the muscles concerned in checking the tendency to knock knee, though in a much slighter degree, by rotating the entire leg outward.

A résumé of the foregoing furnishes these facts:

That there exists a normal tendency to weak foot and knock knee; that this tendency if unrestrained would interfere with the stability of equilibrium and efficient locomotion; that such tendency is checked through muscular tension from hip to heel; that this play between muscle tension and joints is a physiological necessity to elasticity and to protection of the delicate plantar structures in the arch concavity; that the muscles concerned can best act if their action is direct, not diverted, and that direct action or pull of the musculature can only occur when the feet are kept parallel in standing and particularly in walking.

The foregoing discussion is, of course, not intended to be exhaustive as to the relationship between incorrect attitudes and weak feet. What is made plain, however, is that as a prime element of physical education with children, no time should be lost in making the correct attitude of Fig. 4 a fixed routine.

FOOTGEAR.

The numerous objections justly advanced against the vicious types of shoes worn by adults does not warrant discussion here as such do not entirely apply to children's shoes. This is so, fortunately, because the community has become sufficiently civilized as to not put fashion above health with the child's foot by encasing it in tight, narrow and short shoes. Even the girl is allowed a few years lease of foot life before being started on the painful, disabling errand of competing with the Chinese lady in transforming an exceedingly useful organ into a monstrosity. One element of interest concerns us with respect to the shoes of the adult female that may bear on the child's foot. I have in mind prenatal influences that operate to induce a predisposition to foot ailments generally and the weak foot in particular. Here we should view with no little suspicion as a possible contributing agent, the high heel and narrow pointed shoes that are worn by the women especially while pregnant. Such shoes, by compressing the toes and restricting the elasticity of the gait, weaken the muscles which are concerned in maintaining the integrity of the arch, and thus through the generations may result in conferring a predisposition to weakness of the arch by an evolutionary degeneration of muscles and ligaments.

What is of direct concern, however, with the footgear of the child, is the faith of the public in a commercial market flooded with anatomic, orthopedic, and Dr. Blank shoes, to which we have previously alluded. Curiously enough, the importance of other elements of foot pathology are overlooked when it is assumed that a certain manufacturer's label in a shoe is curative. In the fitting element alone, it should be borne in mind that the feet of children vary in contour and action, and as to contour do not follow the very few patterns of the shoe manufacturer. Some feet are long and thin, some short and thick, some highly arched; some have low arches, some possess delicate heel cushions; one child may throw more weight on the ball, another on the heel; most children throw more weight on the inner margin, but some throw weight on the outer margin; ligaments of the knee or ankle may

be weak or disease may have weakened certain structures, and so on.

These and many other considerations do not necessarily call for a special shoe in every case, but should be met by trained medical guidance in fitting with the required modifications provided. Even in the normal child's foot, in view of the rapid and varied growth, it is plain that merely depending on a branded shoe out of stock is insufficient care. The urgent necessity in the case of the pathological foot is thus undeniable. The specific essentials of correct fitting are later mentioned in connection with treatment.

WEAK FEET.

The weak foot occurs commonly in both sexes and generally affects both feet. Its mechanical pathological condition is decidedly peculiar. When off the ground its appearance as mentioned is normal; under weight as in standing or walking it becomes deformed. At rest, there is practically nothing wrong to be seen. A normal range of motion, active and passive, is apparent; there is no muscular restriction or spasm, and only the experienced hand and eye of one who had made a study of the foot might recognize the defect by plantar flexion while viewing the foot plantarwise. Fig. 6 shows a normal foot at rest and will serve as well to illustrate the weak foot at rest. In standing, as shown in Figs. 7 and 8, the line of body weight in the normal foot seems to run straight through the ankle joint on to the arch. When weak feet bear body weight, as in Figs. 9 and 10, we see indications of the inability of the muscles and ligaments to maintain a normal relationship between the segments of the arch and manifest in the abduction of the forefoot, reflecting the angulation through the longitudinal axis of the foot at the astragaloscaphoid articulation with the convexity inward. The head of the astragalus now becomes prominent in front of and lower than the internal malleolus. The posterior view of normal standing feet, Fig. 8, shows the tendon Achilles to be a straight line all the way to its insertion into the heel bone, while in the standing weak foot, Fig. 10, the line of the tendon Achilles curves in and under the ankle joint and in an outward direction at its termination. This curvature of the heel cord in the weak foot reflects the inward collapse of the rear segment of the longitudinal arch, the heel bone itself, whose upper articulating surface has swung inward and its lower weight bearing area outward.

THE FEET AND THE SKELETON.

The feet being obviously the foundation of a relatively heavy and flexible skeleton, we can understand that the weak feet must induce a secondary misalignment of other structures above. There is, therefore, almost invariably a secondary knock knee accompanying, although, of course, an independent form of knock knee may exist without the weak foot influence. But the weak foot creates its own degree of knock knee due to the adduction of the os calcis toward the median line of the body. On top of the heel bone rests the astragalus and, on top of the astragalus, the tibia. The astragalus in the weak foot condition cannot follow the same inward and lateral tilt of the heel, because of its being

firmly wedged between the tibia and fibula, but, as previously mentioned, follows a natural tendency to slide in and forward on the os calcis. With the astragalus the tibia also moves inward through its length and thus the knee joints tend to approximate. That even slight weak foot induces adduction of the knee joints toward the median body line may be demonstrated by placing the finger tips on the patellæ while standing and then voluntarily rolling the two ankles inward. This inward ankle rolling simulates in great measure the mechanical pathological condition of the weak feet and the secondary inward shifting of the knee joints will be easily perceptible.

SECONDARY CHANGES.

Above the knee joint, secondary mechanical deviations are similarly reflected. In advanced cases, particularly with a heavy child, manual palpation at the hip region while having the child voluntarily adopt the normal position and then comparing this with the effect of allowing the child to fall into the weak foot attitude, will demonstrate the referred misalignment at the pelvic region during the weak foot attitude. With this we get an accompanying increase of curvature at the lumbar spine (lordosis) and, of course, the corresponding projection of the abdomen. The increased lumbar curve again often reflects itself in a mild stoop of the shoulders and thus a flattening of the chest results.

The symptoms in individual cases vary as to number and degree. The following is a résumé of typical effects: the child tires easily, is disinclined to play much, rests often, wants to be carried after walking a little, complains of general undefined strain, may show little appetite, and is irritable. It may awaken at night, complaining of unlocalized foot and leg pains. There may be a general nervousness without apparent specific cause, and a complaint of pain in the head or back. As a result of these effects, its school work may be below the average. The shoes wear at the inner heel and sole, and at times holes may be worn at the region of the internal malleolei due to excessive friction and even occasionally to the knocking of the ankle bones in walking. The child is often brought for examination because it frequently stumbles and falls. This stumbling and falling is, of course, occasioned by incorrect posture, the abduction of the forefeet and the referred misalignment at knee, hip and lumbar joints, which materially interferes with a normal gait.

In other cases, the child is brought for examination because excessive intoeing has first attracted the attention of the parents. In walking, the child either toes in or out, but rarely maintains the feet parallel. When the child toes in, it indicates nature's efforts to conserve the integrity of the arch through an instinctive impulse in the child to throw the body weight on the outer and stronger side of the foot. When the child toes out, it may be a symptom of this impulse being too weak or having lost its resistance in combatting the weakness of the affected structures.

(To be concluded.)

Editorial Notes and Comments

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DIPHTHERIA TOXINS.

It would appear from the recent experimental work carried out by Ménard that the bacillus of diphtheria contains two toxic substances, namely, lipoids and proteins. Both orders are toxic, but differ in their effects. The lipoids, above all, produce local lesions. Injected subcutaneously, intravenously, into the trachea or peritoneal cavity, they invariably provoke local lesions characterized essentially by a rapidly occurring necrosis and fibrinous exudate. This combined necrosing and fibrinoplastic action should lead us to regard the lipoids as possessing an important part in the production of local complications in diphtheria, false membranes, and bronchopneumonia. On the other hand, the local action of the proteins is very trifling or nil. But when introduced into the circulation they are extremely toxic and possess a peculiar affinity for the nervous centres. The lipoids also possess the property of fixing to a certain extent the soluble toxin, and this toxin, when secondarily freed, may be the cause of serious tardy accidents.

These experimental results have led Ménard to suppose that although diffusible toxin of the diphtheria bacillus plays the most important part in diphtheritic intoxication, the constitutive poisons of this bacterium must have a no less important action, the lipoids in producing local lesions, the proteins in causing general accidents, although it is as yet impossible to specify their exact nature. Finally, it is perhaps possible that the late occurring accidents of diphtheria are the result of the freeing of the soluble toxin fixed to the microbic lipoids them-

selves and to those of the tissues in which the organism pullulates or that it impregnates in remote parts. Antidiphtheritic or antitoxic sera have no prophylactic or curative action on the lesions determined by the constitutive poisons of the bacillus of diphtheria. It would certainly appear that this likewise applies to bactericidal sera in general. The practical conclusions of Ménard's experiments, given the present state of our knowledge, is that to the use of antidiphtheritic serum, whose exhibition should invariably constitute the basis of the treatment of diphtheria, the prudent application of selected antiseptics should be added, by means of spraying and irrigations, care being taken not to injure the mucosæ. This is also the best means of sterilizing the nasopharynx in germ carriers.

THE CAUSATION OF RICKETS.

The causation of rickets is still an undecided question, but, of course, it is a complex one. A finger cannot be pointed at a single factor as the definite cause. The condition has been for many years ascribed to errors of diet, to lack of fat and excess of carbohydrates in particular, to unhealthy living conditions, to a deficiency of calcium salts, to aberrant or lacking function of one or other of the internal secretions, or even to an infection or intoxication. However, the exact causes are not yet known. Its origin remains obscure.

Dr. Findlay, in the report of the British Medical Research Committee for 1918, draws attention to the fact that in rickets there exist hyperplasia of cartilage, deficient absorption of that tissue with imperfect calcification, and defective formation of bone. He holds that a disturbance of calcium metabolism is not infrequent, but that loss of calcium is not invariable even in acute rickets. In his opinion the entire matter of calcium metabolism both in health and disease requires revision. He believes that the condition is due rather to unhygienic living than to diet deficiency. Dr. Eric Pritchard, in a paper contributed to the *British Medical Journal*, November 15, 1919, expresses the view that the essential and central feature of rickets is the want of calcification or mineralization of developing bone due to the existence of requirements for calcium which for the time being are more urgent than those of developing bone, namely, the necessity for neutralizing or compensating an existing acidosis. Chronic conditions of malnutrition of whatever kind or from whatever cause arising, finally terminate in acidosis, and all varieties of malnutrition during

infancy and early childhood tend to terminate in rickets. Other factors, such as want of muscular exercise, impure air, lack of sunshine, bad housing, and overfeeding, play important parts. Miss Margaret Ferguson states frankly as a result of an investigation undertaken by her into the social and economic factors in the causation of rickets that the evidence is against dietetic cause of the disease, but she does think that unsatisfactory conditions in the home and particularly inadequate air and exercise are potent factors in determining its onset.

In Vienna at the present time there seems to be an almost universal incidence of rickets among children of the poorer classes when older than one year, and both rickets and scurvy have frequently developed in breastfed infants, often when less than six months old. But these facts do not go far toward solving the problem, because conditions, both dietetic and unhygienic, are as bad as possible in Vienna, although perhaps, the dietetic factor seems to intrude itself more obviously than that of environment. Undoubtedly the causation of rickets is complex and the views of Dr. Pritchard appear to be the most rational, that diet plays the most important part, overfeeding for example, but that several other factors must be taken into account. Rickets may be a deficiency disease in that it is due to diets which are unbalanced because they contain too little of those substances which include antirachitic factors and too much of those substances deficient in this respect.

PARADOX.

Syphilis is good. This is the position held by some of the delegates at the convention in Washington on venereal diseases the week of December 6th. How could they in any possible way twist themselves into this paradoxical attitude. First let it be understood that these delegates were typical reactionaries. This will explain much. But let us, in all justice to them, go on and develop their point of view. These men and women opposed education in regard to venereal prophylaxis. They held that it would lower our morals if we knew how to use certain methods for the prevention of syphilitic and gonorrhoeal infection. They stated that a certain number of men abstained from illicit intercourse from fear of infection. If this fear was removed it would increase the number of contacts and prostitution. Therefore, the knowledge of the possibility of infection by syphilis kept men chaste. If this last barrier was broken down it would influence the morals of thirty per cent. of the men who were chaste, according to their figures. These

men would no longer restrain themselves, and would join the larger group who were not influenced by fear. For this reason the knowledge of prophylaxis must be kept from men. Syphilis in the guise of a punishment for transgression would serve a definite purpose. Syphilis was good, for it was the only thing that kept chaste the good men whom they wanted to protect.

If all this is true, affairs are in a lamentable state. The remedy cannot come by suppressing knowledge. If the fear of syphilis is the only thing that keeps men chaste, then there is something fundamentally wrong with our moral code. These matters should receive attention from the men and women who are engaged in trying to improve moral ethics. If the group engaged in this work at present cannot solve the problem without the aid of syphilis and gonorrhoea as their henchmen they should abandon their tactics and seek an occupation for which they are better fitted. As medical men we cannot allow these people, who confess their inadequacy, to invade our field and try to prevent us from imparting the knowledge of medical science to all men and women who care to learn. We cannot permit these incompetent puritans to fill our hospitals and allow twelve per cent. of our population to suffer from syphilis and a large number from gonorrhoea when we have means at our disposal to prevent infection of the majority. We use the Credé method to protect the eyes of the newborn infant. Why not a similar method for the prevention of venereal disease?

All this talk of venereal prophylaxis lowering morals and increasing contact is childish. With the general introduction of prophylaxis education will follow and the real danger of infection will be shown. At present it is a vague, half formed idea. The necessity for venereal prophylaxis will be a constant warning and serve to decrease contact among all groups rather than to increase it among the chaste who are chaste through fear of syphilis. If men are chaste through fear of syphilis alone and have no other moral factor in their makeup, there can be little real worth in them. If there are other factors, then the protection from venereal infection will not change their attitude.

Venereal prophylaxis will not solve the venereal problem. Many other factors are to be considered. Prophylactic stations will not solve the problem, nor will education alone. But all of these weapons should be used just as is being done at present in the State of Pennsylvania. If the uplifters lose ground through the education of men and women, let them redouble their efforts in other directions and perhaps they, too, will come nearer the truth in their quest for morals.

PHYSICIAN AUTHORS: JOHANN C. F.
VON SCHILLER.

German militarism, now happily a thing of the past, had no more bitter opponent than Johann Christoph Friedrich von Schiller, an obscure army surgeon who became the Fatherland's beloved "Poet of Liberty." Schiller knew military bondage at its worst, and hated it with all his heart. This hatred generated a love of liberty which dominated his whole life. The passion for freedom, the instinct of revolt, was ever present in his writings. From the very beginning, when as a school boy he began writing lyrics, his work breathed defiance against the feudalism of the period, and this defiance never subsided. Instead, his zeal for correcting abuses grew with the years so that by the time he wrote *William Tell*, his last completed work, liberty had become to him a mania, a religion. Schiller was perhaps the earliest spiritual predecessor of the Revolution of 1918. The seeds of discontent which he planted against military despotism were a long time in bearing fruit, and the revolution came about with such a tragic mixture of circumstances that sometimes one is likely to overlook the fact that any pioneering whatever was done. Schiller's influence was indirect, but those who have read him and his successors know that the end of Hohenzollernism was not wholly a thunderbolt out of the blue sky, much as it seemed to be at the time.

Schiller was born on November 10, 1759, the son of an army surgeon, and early evinced a liking for the study of medicine. But whatever liking he had for the profession was driven out of him by the distasteful conditions under which he had to study and practise, and he quit at the earliest opportunity. To put it bluntly, he deserted. That was his only way out. At fifteen he had been conscripted into a school established by Duke Karl Eugen of Wurtemberg. This school was operated along the severest military lines, and that it should grate on young Schiller's sensibilities was inevitable. In 1780 he qualified as a surgeon, but instead of being allowed to choose his own field of practice, he was forced to become physician to a regiment stationed at Stuttgart, at eighteen florins a month—about seven dollars. Even under these unsatisfactory conditions Schiller might have continued his medical work in the army had it not been for the fact that the iron handed duke attempted to repress the literary activities with which the young surgeon sought to beguile the hours of his leisure. Schiller had slipped away from the army post on two occasions to attend performances of his first drama, *The Robbers*, at the court theatre in Mannheim. On the first occasion his unauthorized leave was

not discovered, but on the second he was out of luck. The duke not only imprisoned him for two weeks but also forbade him to write any more dramas. After serving his sentence Schiller fled to Bauerbach, in Thuringia, and not only his military career but also his medical career came to an abrupt end. *The Robbers* was written while Schiller was still at the military academy. Finished when he was nineteen, it has been called "probably the greatest triumph ever achieved in the entire field of literature by one so young." It has its faults, to be sure, but for a school boy of nineteen it is truly remarkable. The drama has been described as a declaration of war against the feudalistic society of the period, denouncing with burning zeal the social and political crimes of the day.

Schiller is best known as a poet. His lyrics have had an immense popularity in Germany. He also turned out much ballad poetry of bold and simple outline. There was a more or less steady flow of this poetry from his pen throughout his career, despite his ambitious activities in the fields of the drama, history, and philosophy. Germany has produced no poet more beloved by his countrymen. Although Goethe excelled him in nearly every field and Heine outstripped him in lyric perfection, it was Schiller whom the German people took to their hearts. He is a giant figure in German literature, but in world literature his rank is somewhat subordinate. Somehow his genius fails to enthuse those not of Germanic temperament and background. Even in Germany, where his star blazed supreme for more than a century, there is said to be less enthusiasm for him. He is slowly going out of fashion. But his decline is likely to be very slow. He is still a textbook for German youth and his words are still in the mouths of men.

Of Schiller's dramas, *William Tell* has produced the deepest and most enduring impression. His dramas are full of grave eloquence, and considerable coarseness, but critics have pointed out that no very exalted moments mark his work. His best mood was one of dignified melancholy. In the first period of his literary career he wrote three prose tragedies, followed by a blank verse tragedy, *Don Carlos*. During the following years he studied and wrote history and philosophy. His histories include *The History of the Revolt in The Netherlands* and *History of the Thirty Years' War*, both written with splendid dignity and both immensely popular. He also wrote a volume of *Historical Memoirs*. His philosophical writings were largely an elucidation and widening of Kant's theories. Kant's *Critique* and Schiller's *The Robbers* appeared in the same year, 1781.

Goethe and Kant both had an immense influence on Schiller's work. Goethe's influence was direct. The two were inseparable friends during Schiller's later years. It was under Goethe's stimulus that Schiller won fresh laurels in poetry at the time the two were coeditors of *Die Horen* and *Thalia*. In the last six years of his brief span of life Schiller produced five verse tragedies and part of a sixth. All are dominated by the idea of Nemesis. Schiller's admiration for Greek tragedy in his last few years left him always in search of subjects in which the Greek idea of destiny prevailed: *Wallenstein* was the most ambitious of the list, *William Tell* the most popular. The other three also are on historical subjects—*Marie Stuart*, based on the life of Mary, Queen of Scots; *The Maid of Orleans*, and *The Bride of Messina*. He also translated and adapted *Macbeth* and Gozzi's *Turnadot*, Racine's *Phedre*, and two comedies by Picard. In the last two months of his life he began a new tragedy, *Demetrius*, based on Russian history, which remains a fragment in two acts. Schiller died in 1805 at the age of forty-five. Personally he was one of the most lovable of men. As his great admirer, Thomas Carlyle, pointed out, he "had all the good qualities of the German character in a high degree and few of its defects."

POET AND PHILOSOPHER.

Poet philosopher, Henri Bergson has been called, sometimes with profound appreciation, sometimes with disparagement. Is he a poet, is he a philosopher, and in either capacity does he effect any benefit to humanity? All men are full charged with poetry, according to his doctrines, for all are inseparably one with the stream of living, compact with all that has been, and charged with the possibilities of what may be. But even in the form of life at the head of the stream, the human, this fullness is dumb. It manifests itself only imperfectly, restrained, yet always bursting the bonds of static definition or of the materialism which it has set itself.

Amid this multitude of restrained and unwitting poets there arises occasionally the rarer poet of expression. He sets forth in winged words the truth of these created limitations which are ordinarily recognized as the sum of life. Much more he proclaims the compressed power which creates these, only again to outflow them. This is pregnant poetry. It is a philosophy of life which men crave, even if they know it not. Many philosophers have so befuddled their task of discovering the meanings in life that for such an one as Bergson it is fitting

to seek a new term. Philosopher, lover of wisdom, should become lover of life. His love of life is simple enough, genuine enough, to search for its meanings exactly where they are displayed, just within our vital activities. The term humanist ought to cover the depth of his insight and the elasticity of his vision backward into the depths of *Mind Energy*, or onward into its unceasing creative activity. Therefore we may borrow this term from the "humanist" thinkers. Bergson reveals kinship with those philosophers who come down to examine the every day matters of the human mind, a common kinship with each separate human existence. This appears both in the translator's introduction to a recently appearing handbook of some of Bergson's investigations into mental facts, as well as in the actual text throughout the book. [*Mind Energy*. By Henri Bergson. New York: Henry Holt and Company, 1920.]

Bergson sets forth there in such forceful manner so many much disputed or even ordinarily undiscovered mental facts that it may be profitable to analyze into the duller but more familiar language of every day some of his more compact expressions. A few of them brought before the reader now and then may recall him to the dynamic intensity whereby alone man "inserts his free action into this material world." Often for physician, commonly for patient, life has lost its savoriness or the flames of enthusiasm have died down under the ashes of depression. Image it as we will, the poet philosopher restores the flavor, revives desire. He directs telling words into the heart of facts. Knowledge of them is power, his spirit of comprehension of them enkindles determination. It is a privilege of the present day to examine the words and enter into the inspiration of this writer.

PROPER MEDICAL ATTENTION.

It is gratifying in these days of sullen reproach by labor against employers, to learn that one injured seaman, an illiterate Porto Rican, was able to obtain compensation which satisfied even his union. The law is that a ship carrying above fifty passengers beyond cabin passengers must provide a doctor. In this case there were not fifty. The man scratched his hand on a rusty nail and the steward gave him a bichloride tablet to dissolve for bathing, and some iodine to paint the wound. However, it grew worse, and he had to have the hand amputated on arrival in New York. The contention was that there was time before the ship left the Antilles to see a doctor, and the steward ought to have recognized the necessity. The man was awarded ten thousand dollars, though the doctor called said the steward had erred through ignorance of the danger.

News Items.

Deaths from Automobile Accidents.—During the year 1919 there were 7,969 deaths from automobile accidents in the Census Bureau's registration area, which comprises about eighty per cent. of the country's population. This is an increase of 444 over the total for 1918.

A Union Health Centre.—A health centre has been established at 131 East Seventeenth Street, New York, by the International Ladies' Garment Workers' Union, to guard and promote the health of the workers in the garment industry. This institution, the first health centre to be established on an industrial basis, will serve the 100,000 workers of the union. The formal opening will take place Saturday evening, December 18th, at 7:30 o'clock, and among the speakers will be Dr. Royal S. Copeland. Dr. George M. Price is director of the institute.

Walter Reed Hospital Damaged by Fire.—Two of the psychopathic wards of the Walter Reed Military Hospital were destroyed by fire on Sunday, December 12th. The two wards, in one of which the violently insane were confined and in the other psychopathic patients received treatment, contained about seventy-five patients. The fire threatened to spread to other wards, including several in which disabled war veterans were patients, but it was checked. One patient, a soldier, is missing, and it is believed that he was burned to death. Several were injured, but none seriously. The loss is estimated at \$25,000.

Medical Association of the Greater City of New York.—A stated meeting of the association will be held in Dubois Hall, New York Academy of Medicine, Monday, December 20th, under the presidency of Dr. George L. Brodhead. The program will include the following papers: Use of Radium in Gynecology, by Dr. Howard C. Taylor; Use of Radium in Surgery, by Dr. W. S. Schley; Use of Radium in Genitourinary Diseases, by Dr. B. S. Barringer. Among those who will take part in the discussion are Dr. Robert Abbe, Dr. James Ewing, Dr. William S. Stone, Dr. D. C. Moriarta, Dr. C. E. Field, Dr. James A. Corscaden, Dr. George Willis, Dr. Oswald S. Lowsley, Dr. E. L. Keyes, Jr., and Dr. Winfield Ayres.

Dietitians Wanted by the Public Health Service.—The United States Public Health Service announces that dietitians are needed in the hospitals of the service. Women graduates of schools of household economics, who have had student training or hospital experience in civilian or Army hospitals, are eligible for appointment. The work, which has to do with the victualing of the hospitals, was transferred a year ago from the pharmacists to a newly established dietitian service. The section has steadily expanded, but owing to the opening of many new hospitals and the enlargement of those already in operation the dietetic personnel is as yet not nearly up to the requirements. Applications for appointment should be made to the Surgeon General, United States Public Health Service, Washington, D. C.

Bequests to Hospitals.—By the will of the late Commodore Elias C. Benedict, the Flower Hospital and the Ophthalmic Hospital, of New York, will each receive \$150,000.

By the will of the late Francis Lynde Stetson, St. Luke's Hospital and the Lying-In Hospital, New York, will each receive \$25,000.

Psychopathic Hospitals for Soldiers.—Senator Wadsworth, of New York, has introduced a resolution authorizing the Secretary of the Treasury to lease from New York State a \$3,000,000 hospital for the care of nervous and mental disease cases among disabled soldiers, which would be built in New York city. The resolution also would give the Treasury Department authority to lease any other hospitals built for like purposes by other States.

Life History of Mosquito Shown in Moving Pictures.—A new motion picture film, prepared at the request of the United States Public Health Service, presents the life history of the mosquito, especially of the kind that transmits malaria germs and costs the United States people about \$200,000 a year by so doing. The film was exhibited for the first time at the meeting of the Southern Medical Association held recently in Louisville, Kentucky.

Women Ask for \$4,000,000 Appropriation to Reduce Infant Mortality.—The women of the United States have asked Congress to appropriate \$4,000,000 to carry on a campaign of education among young mothers. They call attention to the fact that last year there were 250,000 deaths of infants in America, or about 20,000 a month, and most of these deaths could have been averted by proper attention. In 1918, 23,000 mothers died from preventable causes. Fully eighty per cent. of the cases investigated showed that lack of care was the principal cause of death. The Sheppard-Towner Bill which will be presented to Congress soon provides for an appropriation of \$2,000,000 at first, with an annual increase until the sum equals \$4,000,000. The various states will be asked to cooperate by appropriating dollar for dollar with the federal government.

Inadequate Hospital Accommodation for Ex-Service Men.—Surgeon General Hugh S. Cumming, of the United States Public Health Service, calls attention to the fact that additional hospital facilities are needed for the treatment of former service men and women, and recommends the appointment of an administrative head for the three major agencies involved in rehabilitation work. Emphasizing the need for additional hospital facilities, Dr. Cumming pointed out that twenty thousand patients were receiving hospital care from the Public Health Service on July 1, 1920, compared with two thousand in October, 1919, and urged that Congress make available funds for new construction. Many of the hospitals now owned and operated by the Public Health Service are dilapidated. These patients will require treatment for long periods of time, and their demand is for care and treatment in governmental institutions.

Police Association Oppose Hospital Project.—

The Patrolmen's Benevolent Association, which has a membership of nearly 10,000 of the rank and file of the uniformed force, has gone on record as being opposed to the proposed \$5,000,000 Police Hospital. Opposition to the hospital is based on six points, among which were that the patrolmen did not wish to be regarded as objects of charity, and that there was no need for such a hospital.

Child Labor Increasing.—

The National Child Labor Committee calls attention to the fact that in spite of increasing adult unemployment more children left school to go to work in 1920 in many industrial centres than in 1919. Fourteen states report an increase in child labor during the first six or eight months of 1920. In New York city 5,283 more children applied for work permits in the first six months of 1920 than in the same period last year, but in the last three months there has been a decrease in applications so that the total increase is only 2,353. In Baltimore County, Md., there were 4,064 more applications for work permits up to October 31, 1920, than in 1919, while during the summer the Chicago authorities reported an increase of 13,000, and in Minnesota there was an increase of 193 per cent. since 1915.

Yellow Fever Control.—

A new factor has been introduced in yellow fever control by the possibility of rendering persons immune to the disease by vaccination. People going to tropical countries are now being vaccinated at the Broad Street Hospital, the vaccine being furnished by the Rockefeller Institute. This vaccine for yellow fever was discovered by Dr. Hideyo Noguchi, of the Rockefeller Institute. The first shipment of vaccine from the Rockefeller Institute to tropical countries was made a year ago, when three hundred bottles were sent to Mexico. Other shipments have been made since then, the latest on November 10th. All vaccine supplied to Mexico is sent to the Mexican Department of Health, which arranges for its distribution. The Central American countries are so well convinced of the efficacy of Dr. Noguchi's vaccine that they are permitting travel without quarantine detention of those who have been successfully vaccinated.

Boston Meeting of the A. M. A.—

The local Committee on Arrangements for the annual meeting of the American Medical Association, to be held in Boston, June 6 to 10, 1921, has been organized as follows: Chairman, Dr. F. B. Lund; secretary, Dr. Richard H. Miller. Subcommittee on finance: chairman, Dr. Hugh Williams; secretary, Dr. Channing Frothingham; treasurer, Dr. A. William Reggio. Subcommittee on sections: chairman, Dr. William H. Robey, Jr.; secretary, Dr. H. Archibald Nissen. Subcommittee on exhibits and printing: chairman, Dr. D. F. Jones; secretary, Dr. George Gilbert Smith. Subcommittee on hotels: chairman, Dr. John T. Bottomley; secretary, Dr. Stephen Rushmore. Subcommittee on entertainments: chairman, Dr. C. A. Porter; secretary, Dr. A. W. Allen. Subcommittee on registration: chairman, Dr. A. S. Begg; secretary, Dr. Samuel R. Meaker. Subcommittee on clinics: chairman, Dr. J. C. Hubbard; secretary, Dr. R. S. Eustis.

Meetings of Local Medical Societies.—The following medical societies will meet in New York during the coming week:

MONDAY, *December 20th.*—New York Academy of Medicine (Section in Ophthalmology); Medical Association of the Greater City of New York; Psychiatric Society of Ward's Island; Yorkville Medical Society.

TUESDAY, *December 21st.*—New York Academy of Medicine (Section in Medicine); Federation of Medical Economic Leagues.

WEDNESDAY, *December 22nd.*—New York Academy of Medicine (Section in Laryngology and Rhinology); New York Society of Internal Medicine; Brooklyn Pediatric Society.

THURSDAY, *December 23rd.*—New York Physicians' Association; Ex-Intern Society of Methodist Episcopal Hospital, Brooklyn; Hospital Graduates' Club, New York.

FRIDAY, *December 24th.*—Academy of Pathological Sciences; Audubon Medical Society; New York Clinical Society; Brooklyn Society of Internal Medicine (annual).

Personal.—Professor C. E. A. Winslow, of Yale University, will direct the public health work of the League of Red Cross Societies in Europe, and has been granted leave of absence for five months, beginning February 1, 1921.

Dr. A. Strachstein has been appointed chief of clinic and cystoscopist to the Bronx Hospital.

Dr. George L. Laporte has resigned as assistant professor of clinical medicine at the College of Physicians and Surgeons, Columbia University. His resignation took effect on December 1st.

Surgeon J. W. Kerr, of the United States Public Health Service, sailed for Europe on November 20th, with Commissioner General of Immigration Caminetti, to assist in the investigation of emigrant conditions in Europe.

Dr. Arthur S. Tenner announces his return from the Near East and will resume practice at 70 East Fifty-sixth Street, New York. Dr. Tenner, formerly a captain in the Medical Corps, U. S. Army, served in Turkey and Syria as chief eye surgeon of the Near East Relief Expedition, residing in Aleppo, Syria, for the past year and a half.

French Physician Acquitted.—A noncommittal verdict has been rendered by the judges at Nimes, France, in the case in which the parents of two girls brought suit against Dr. Mazel for damages for the death of the girls while under his medical care. The case against the doctor was that he employed an unskilled nurse, who, by not paying proper attention to the cleanliness of surgical instruments, aggravated the illness of the girls, and that the doctor did not follow the prescribed treatment. The father of the girls, Commandant Arnaud, sued for 200,000 francs, and at the same time the charge of criminal homicide was brought against the doctor by the public authorities.

The court, after long deliberation, brought in a verdict acquitting the doctor, refusing damages to Commandant Arnaud, and at the same time refusing the counterclaim for one franc damages brought by the doctor. Commandant Arnaud will have to pay the costs. In the verdict the judges state that they found that the nurse employed did not take proper precautions, and that the doctor ought to have supervised her work more closely. The death of the patients, they found, did not, however, result from neglect, and it was on that that they based their judgment.

Book Reviews

NEW BOOKS ON PEDIATRICS.

Diseases of Children. Presented in Two Hundred Case Histories of Actual Patients Selected to Illustrate the Diagnosis, Prognosis, and Treatment of the Diseases of Infancy and Childhood. With an Introductory Section on the Normal Development and Physical Examination of Infants and Children. By JOHN LOVETT MORSE, A. M., M. D., Professor of Pediatrics, Harvard Medical School; Visiting Physician to the Children's Hospital, and Consulting Physician to the Infants' Hospital and at the Floating Hospital, Boston. Third Edition. Illustrated. Boston: W. M. Leonard, 1920. Pp. v-639.

Diseases of Nutrition and Infant Feeding. By JOHN LOVETT MORSE, A. M., M. D., Professor of Pediatrics, Harvard Medical School; Visiting Physician to the Children's Hospital; Consulting Physician to the Infants' Hospital and the Floating Hospital, Boston; and FRITZ B. TALBOT, A. B., M. D., Chief of Children's Medical Department, Massachusetts General Hospital; Physician to Children, Charitable Eye and Ear Infirmary; Consulting Physician at the Lying In Hospital, and at the Floating Hospital, Boston. Second Edition, Revised. New York: The Macmillan Company, 1920. Pp. ix-384.

Manual of Diseases of Children. By JAMES BURNET, M. A., M. D., M. R. C. P., Physician for Diseases of Infancy and Childhood at the Marshall Street Dispensary, Edinburgh. Second Edition. Illustrated. New York: William Wood & Co., 1919. Pp. i-416.

Principles and Practice of Infant Feeding. By JULIUS H. HESS, M. D., Professor and Head of the Department of Pediatrics, University of Illinois College of Medicine. Illustrated. Second Revised Edition. Philadelphia: F. A. Davis Company, 1919. Pp. i-343.

Leitfaden der Kinderheilkunde für Studierende und Ärzte. Von Dr. WALTER BIRK, Professor d. Kinderheilkunde a. d. Universität Tübingen. Erster Teil; Säuglingskrankheiten Vierte, verbesserte Auflage. Mit 25 Abbildungen im Text. Bonn: A. Marcus & E. Webers Verlag (Dr. zur. Albert Ahn), 1920.

Leitfaden der Kinderheilkunde für Studierende und Ärzte. Von Dr. WALTER BIRK, Professor d. Kinderheilkunde a. d. Universität Tübingen. Zweiter Teil; Kinderkrankheiten mit 10 Abbildungen im Text und auf einer Tafel. Bonn: A. Marcus & E. Weber's Verlag (Dr. zur. Albert Ahn), 1920. Seiten 138.

Diagnostik und Therapie der Kinderkrankheiten. Mit speziellen Arzneiverordnungen für das Kindesalter. Ein Taschenbuch für den praktischen Arzt. Von Prof. Dr. F. LUST, Oberarzt der Universitäts-Kinderklinik in Heidelberg. Zweite neubearbeitete Auflage. Berlin N-Wien I: Urban & Schwarzenberg, 1920. Seiten vi-471.

Morse, in his textbook on *Diseases of Children*, has followed the excellent example set by Southard and Green in publishing his works in the form of case histories. While we have been accustomed to seeing case histories quoted in papers and even in textbooks, we have not had them presented to us in the same way before. In this instance the emphasis is placed on the case history. It is an individual example. It acquires individuality by virtue of the variations it possesses and these variations are the puzzling things encountered in medical practice which make a differential diagnosis difficult. Autopsy reports frequently tell the final story of a wrong diagnosis. We are too prone to seize on a symptom or syndrome in a certain case and conclude our diagnosis, forgetting for the moment that other diseases may present a similar train of symptoms. From the study of case histories, or, we

may say, the study of additional patients, for that is all it amounts to, we learn to look upon each patient as an individual suffering from some maladjustment to surrounding conditions; we realize that a certain individual, even an infant, will react much the same to many different infections or afflictions. In this way the patient becomes the more important, the disease the less important problem.

Morse takes us to his clinic and presents two hundred case histories of actual patients. His object is to illustrate the diagnosis, prognosis, and the treatment of the diseases of infancy and childhood. He also gives an introduction which deals with the normal development and physical examination of infants and children. We are told all this on the frontispiece, but it covers the ground. A book of this kind acts as a stimulus to the practitioner, for it brings to him the familiar phases and conditions as he encounters them at the bedside and at the clinic. It is far more stimulating than the cut and dried statements generally found in the ordinary textbook.

This is the third edition of the work. In it the table of growth for the first four years has amplified, a blood pressure table has been added, there is additional comment on congenital obliteration of the bile ducts, obstetrical paralysis is discussed and directions given for serum treatment. The entire section on the gastroenteric tract has been rewritten, and case reports given of indigestion from an excess of breast milk, of artificial food, of fat in artificial food, of sugar, of maltose, and of starch. A valuable chapter has been added on the home modification of infant foods and the determination of their composition and value. The directions for the administration of salvarsan and mercury have been extended. Many other parts have been added to and changed. There has been no fear shown in discarding methods proved to be superseded by others more advantageous, nor in adopting others more efficacious, no matter from what source they came. More light is shed on tetany, the treatment of whooping cough, nephritis, food values, and enuresis. There is a freedom in the handling of these subjects that is gratifying. The book falls naturally into three divisions, the normal child, infant feeding, and the diseases of children. More could be said in praise of the book, but the practitioner can readily see the advantage of a textbook which handles the problem from the viewpoint of the case history, and Professor Morse has the faculty of giving a most human touch to the subjects he brings before his readers.

* * *

Morse and Talbot have revised their textbook on *Diseases of Nutrition and Infant Feeding*. The methods described are those taught in the Harvard Medical School. The various aspects of infant feeding are described. The advantages and disadvantages of changes from normal feeding are taken up in detail from the chemical and biological viewpoints. The proteins, fats, sugars, starches and

salts are taken up and discussed in turn. Breast feeding also occasions disorders. The subject of the wet nurse is also presented. Then the diseases of the gastrointestinal tract are discussed in detail, and the book closes with a section on the diseases of nutrition. A very broad attitude is taken throughout the book and extensive references are given.

* * *

Burnet's small book on the diseases of children covers an extensive field. When pediatrics first became a specialty a book of this scope would have been considered an undertaking of some magnitude, but today, with the subdivisions of feeding, nutrition, infections, and various other disorders, and the groupings of the newborn, the nursing child, it is convenient to have a small textbook for reference which will cover the entire field which has been so finely subdivided. The divisions are necessary for the scientific worker, but they serve little purpose for the practitioner. The first two chapters on the examination of sick children, which might have been made to include all children, and the points of difference between adults and children, are of especial value. Usually the physician thinks he knows how to approach a child and how to handle it, but careful observation will show that if he would give the matter more thought and heed the admonitions of men of experience, like Burnet, they would make better progress. Burnet is sometimes very vague in his treatment, and is especially prone to make general sweeping statements. He assumes frequently, under this heading, that the physician knows what to do, even to the point of completely ignoring his generalized instructions when they are not found satisfactory. In the chapter on mental and nervous disease, many statements are made in regard to diagnosis, and more especially in regard to treatment and prognosis, to which the modern neurologist will take exception. There is too much generalization and apparently in this field the author is not as much at home as in some of the other sections of the book. Burnet makes a needless apology for the inclusion of the diseases of the ear, nose and throat. This section is a most necessary one, for frequently diseases which would eventually become systemic can be detected by a careful observation of these special organs. Again, much information of value will come from a careful examination of these anatomical parts in every case.

* * *

Hess presents no new or startling ideas in his book on the *Practice of Infant Feeding*. In fact, most of the ideas set forth are a résumé of the work of other writers. However, he has endeavored to pick out the best methods, the most simple and the most satisfactory, and give them to the reader in a simple fashion so as not to complicate matters too much. The computation of feedings and feeding time for the general practitioner has always been somewhat of a puzzle and frequently a bore. It is hard for a busy physician to realize the difference in the dietary between his own and a very young infant. It is hard for him to realize that the

amount of care and mathematical calculation required to make a correct feeding scale for each infant was at one time necessary for him. This book will serve as an efficient reminder and will also enable him to establish a correct diet for the most difficult feeding case in a minimum amount of time.

* * *

New editions of Birk on the diseases of the nursing child have been rather prolific. Less than a year elapsed between the third and fourth editions. Due to the adverse living conditions in the central European countries, on account of the war, many new problems have confronted the pediatricists. Birk is very thorough in the field he covers. In his analysis of feeding conditions he presents some graphic formulæ which are extremely simple. When he speaks of the chemistry of food he is somewhat didactic. He goes into a careful examination of the comparative values of cow's milk and breast milk.

First we have the pathology and physiology of the stillborn, the premature child and the so-called normal child. Then come the nursing problems and hygiene, the disorders of alimentation, and finally the various diseases and disorders. The book is of especial value to the pediatricists in this country, for it contains a vast amount of work which was done in the Germanic countries during the war and which has been inaccessible to the physicians in this country.

* * *

Birk's second book on the diseases of children older than the nursing age is a first edition and should not be confused with his book for nursing children. Here he handles in a very satisfactory fashion the common infections. He places more emphasis on the treatment and diagnosis. He does not pretend to cover the entire field, but the subjects he covers are well done. His writing is not involved and has a certain amount of wholesome vigor that takes away from the ordinary textbook monotony. On the whole, his presentations are good. The second book of the series is not as finished as the book on suckling infants, but contains many illuminating deductions.

* * *

Lust is rather ambitious in attempting to cover a rather extensive territory in his book on children's diseases, or, more accurately, the therapy of pediatricians. This is the second edition of his book, yet we may look upon it as his first, for while the first edition was published in 1918, on account of the war it was not available in this country.

A goodly portion of the book is devoted to the formulæ of various therapeutic measures, prescriptions, régimes, etc. These are not as valuable in this country as they may be in Germany, for in regard to drugs and methods our line of procedure is at variance with theirs in many respects. The merits or demerits of the various schools need not be gone into. However, many physicians in this country will avail themselves of the opportunity of finding out what progress has been made in the Central European countries during the years of the war.

TYPHUS AND RELAPSING FEVERS IN SERBIA.

The Serbian Epidemics of Typhus and Relapsing Fevers in 1915. Their Origin, Course, and Preventive Measures Employed for their Arrest. An Etiological and Preventive Study Based on Records of British Sanitary Mission to Serbia in 1915. With Maps and Charts. By WILLIAM HUNTER, C. B., Colonel, A. M. S. Reprinted from the *Proceedings of the Royal Society of Medicine*, 1919. Vol. iii, Section of Epidemiology and State Medicine, pp. xxix-158. London: John Ball, Son & Daniels-son, Ltd., 1920. Pp 158.

This little monograph has been prepared with great care and is an excellent piece of work. Typhus, once the nature of the disease and the manner of its transmission were known, was thought to be wiped out, but the wars of man and life in the trenches brought the disease back in epidemic form. It swept through Serbia like a prairie fire and scarcely a family remained untouched. It was here that Hunter made his studies. He presents them now that the benefits of his findings may be applied in the countries which are yet in a state of war. Typhus is still rampant in Poland and parts of Russia. In certain districts it occurs in endemic form; in parts of Mexico and on the lower east side of New York City. It seems strange that this dreadful disease, which is so easily eradicated, should still be prevalent. Perhaps with a reappearance of a semblance of sanity among the peoples of earth typhus will become extinct. In the meanwhile there is still need for a study of the malady and no more complete work has been offered recently than that of William Hunter.

LIMITS AND FLUXIONS.

A History of the Conceptions of Limits and Fluxions in Great Britain from Newton to Woodhouse. By FLORIAN CAJORI, Ph. D., Professor of History of Mathematics in the University of California. With Portraits of Berkeley and Maclaurin. Chicago and London: The Open Court Publishing Company, 1919. Pp. viii-299.

He who professes to give an account of men who have cleared a path, to tell of their work and its value, should remember that insufficient references annoy rather than help. To pretend that a man or a book is so well known that full titles are not necessary is really a lazy way of escaping trouble and makes the real student distrustful of the whole work. To seek an initialless author and his book (wrongly titled) makes the most patient reader sadly sigh or strongly swear. But no such emotion will tarnish the welcome given to Florian Cajori, for he marshals his exponents of limits and fluxions in admirable order, and, not only that, but the full title and date of the work of each is supplied. The audience room is crowded—Newton, Berkeley, the celebrated Bishop of Cloyne, Maclaurin, a keen disputant, Carnot, D'Alembert, L'Grange, Cauchy, all with their own ideas and unwilling to admit those of Newton. There is a doctor, too, George Cheyne, of Edinburgh, who, besides the differential calculus, also treats the pathological calculus, and, besides that, atheism and other more light subjects. A few of the men are denying that the circumference of a circle, or any other curve, can be identical with the periphery of any polygon whatever. Berkeley also wrote to Iurin, "For a fluxionist writing about momentums to argue that quantities must be equal

because they have no assignable difference, seems the most injudicious step that could be taken; it is directly demolishing the very doctrine you would defend. For, it will thence follow that all homogeneous momentums are equal, and, consequently, the velocities, mutations or fluxions proportional to these are likewise equal. There is, therefore, only one proportion of equality throughout which at once overthrows the whole system you undertake to defend."

The dispute waxes hot, but, with the main statements of each man in Cajori's book, we can follow the argument easily, or, being amply, richly leisured, the arguer's own books. Among the disturbing pile of volumes in the educational booksellers this should be the one the tired man will get most help from on the subject. Certainly it shows the amount of thoughtful work put into it.

THE DARK MOTHER.

The Dark Mother. By WALDO FRANK. New York: Boni and Liveright, 1920. Pp. 376.

The book is too long, the sentences too short. The book with all its length arrives at no particular place. The sentences, often only choppy groupings of words, finish nothing, explain comparatively little, splash color about with too much of the disjointedness of ineffectual pain.

And that is it. The reader feels that there must be behind the book an author who is vainly catching at life in many directions, ignorant of a "canalization" that brings its fragments into relation to purpose. His pages give one the sense of acquaintance in part with many partial urges, but not yet developed out of their childish separateness. There are evidences of deeper psychic penetration into some of these phases. There are episodes of revealing discussion of the relation of parents and children, of brother and sister, both running with the lives of the main characters of the book. These family relationships with their dominations, their fierce reactions, their estrangements, their drawing power toward unsafe dependence, all these are handled with insight into their real significance. They follow with the sharply individual character drawings that fill the many pages of the volume.

Unfortunately, Frank has been unable to gather all this into that undefined unity which makes a work of art. Such a work must represent the scattered elements of the real world. It must, however, at least point a synthesis, which is only that same canalization which finds in the elements the material by which it travels onward. It is the same with some of the more external promises of the book. They lead us to expect something of the light of thoughtful fiction upon political and economic questions of two decades ago. The promises soon fade. Like the stories of the chief characters themselves, their mentions seem to be unrelated to a goal.

The lives of Tom and Cornelia have been beaten upon early by the blows of a father, which have prevented wholesome unity in its most essential sphere, their own true inward selves. They cannot unite their scattered impulses. Both achieve material success, but both are divided as to their deepest needs. So was their attitude toward their father

split into the ambivalence of love and hate. Strange wonder that Tom lives a conscious double life with himself, and Cornelia's creativeness puffs itself out in a final renouncement of the boy David. She realizes the maternal in her love, but its hopeless incongruity also, as only a gathered reaction against father and brother entanglement.

David's life carries the dreams of the ideal. Yet it, too, is an unsatisfactory picture of one knows not what. The same cool, meaningless separateness lies between his attempts to hold his ideal and to find the world of harder things. A curiously crass carnalism seems as little to disturb the tenor of his aims as in any way to perform any service really linked with those aims. He, too, struggles purposeless in the more embracive sense. True, his fleshly affairs give him some glow of awakening, but one asks whether such mere casualness marks the life of men and women so generally as the author would lead us to believe. These incidents, just like all the sketchy pictures of the great city where the story moves, show distraughtness in the mind of the writer. The book is too indicative of partial trends, of an unsynthesized grouping of interest, to be real literature.

DOMNEI.

Domnei. A Comedy of Woman Worship. By JAMES BRANCH CABELL. New York: Robert M. McBride & Co., 1920. Pp. viii-218.

Minstrelsy knew this story long ago as each one of us dreams it to himself today. A life devoted to the fairest lady, a heart sworn to her service, with torture and waiting, hardship and bitter fighting endured on her behalf.

The troubadours vied with each other to sing of such devotion; we have the privilege of living it breathlessly, painfully, and blissfully with Perion. This is not lovemaking according to note. The medieval songsters had their formulæ, but somewhere outside the rules laid down living beings loved; and here they are.

It is for you to discover the tender melody in Cabell's romance of Perion and Melicent. We can only tell you how they met and parted, how Perion, warring against the unbelievers, was captured by Demetrius of Anatolia, and how Melicent went in search of Perion. The story is vivid enough for any lover of adventure and brave deeds.

The men and women in it you must learn to know for yourselves, to recognize in your secret hearts all that there is of poetry, beauty, and unwavering truth in this simple tale.

TRUE LOVE.

True Love. By ALLAN MONKHOUSE. New York: Henry Holt and Co., 1920. Pp. vi-373.

The author had a collection of fine ideas on play writing, also on unity of nations, conscientious objectors, and war generally. They were all piled up on his study floor and he wanted to talk to the people about them. An essay? No; the subjects did not run smoothly together. There was that question whether an English soldier should marry a German girl. Why not write a novel? So he gathered characters who by their deeds would show forth his views.

The hero, playing his part, suddenly remembers he is a mouthpiece for Mr. Monkhouse, and talks accordingly, but too lengthily. Sister Mary and the German girl, Sibyl, whom Arden, the hero, marries, are fine characters, but they too are worried by the amount of information they have to give the reader and so become dull. There is so much which is good in the book that one may confidently say the author will be more at home with the characters he creates and the readers he hopes to gain in his second inky venture. The death of both hero and heroine rather indicate the author to have been a trifle tired of his own creations.

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

CHILDREN BY CHANCE OR BY CHOICE. And Some Correlated Considerations. By WILLIAM HAWLEY SMITH. Boston: Richard G. Badger (The Gorham Press), 1920. Pp. 361.

ELECTRICAL TREATMENT. By WILFRED HARRIS, M.D., F. R. C. P., Senior Physician and Lecturer on Neurology, St. Mary's Hospital; Physician to the Hospital for Epilepsy and Paralysis, Maida Vale. Illustrated. Third Edition. New York: William Wood & Co., 1920. Pp. x-354.

THE SYSTEMIC TREATMENT OF GONORRHEA IN THE MALE. By NORMAN LUMB, O. E. B., Late R. A. M. C., Specialist in Venereal Diseases, and Officer in Charge of Division, 39 and 51 General Hospitals, B. E. F.; Clinical Assistant, St. Peter's Hospital for Stone. Second Edition. Philadelphia and New York: Lea & Febiger, 1920. Pp. viii-123.

ZEITSCHRIFT FÜR TUBERKULOSE UNTER MITWIRKUNG DER HERRN PROF. BABES (Bukarest), Prof. BANG (Kopenhagen), Geh. Med.-Rat. Doktor BEHLA (Charlottenburg), Dr. LEO BERTHENSEN (St. Petersburg) und so weiter. Herausgegeben von M. KIRCHNER, F. KRAUS, W. v. LEUBE, J. ORTH, F. PENZOLDT. Leipzig: Verlag von Johann Ambrosius Barth, 1920. Seiten 64.

PUBLIC HEALTH AND HYGIENE. In Contributions by Eminent Authorities. Edited by WILLIAM HALLOCK PARK, M. D., Professor of Bacteriology and Hygiene, University and Bellevue Hospital Medical College, and Director of the Bureau of Laboratories of the Department of Health, New York City. Illustrated with One Hundred and Twenty-three Engravings. Philadelphia and New York: Lea & Febiger, 1920. Pp. xvi-884.

SURGERY. ITS PRINCIPLES AND PRACTICE. For Students and Practitioners. By ASTLEY PASTON COOPER ASHHURST, A. B., M. D., F. A. C. S., Associate in Surgery in the University of Pennsylvania; Surgeon to the Episcopal Hospital and to the Philadelphia Orthopedic Hospital and Infirmary for Nervous Diseases; Colonel, Medical Reserve Corps, U. S. Army. Second Edition, Thoroughly Revised. With Fourteen Colored Plates and 1,129 Illustrations in the Text, Mostly Original. Philadelphia and New York: Lea & Febiger, 1920. Pp. xi-1202.

PRACTICAL BACTERIOLOGY, BLOOD WORK, AND ANIMAL PARASITOLOGY. Including Bacteriological Keys, Zoological Tables, and Explanatory Clinical Notes. By E. R. STITT, A. B., Ph. G., M. D., Sc. D., LL. D., Rear Admiral, Medical Corps, U. S. Navy; Commanding Officer and Head of Department of Tropical Medicine, U. S. Naval Medical School; Graduate, London School of Tropical Medicine, etc. Sixth Edition, Revised and Enlarged, with One Plate and One Hundred and Seventy-seven Other Illustrations Containing Six Hundred and Thirty-seven Figures. Philadelphia: P. Blakiston's Son & Co., 1920. Pp. xi-633.

Practical Therapeutics and Preventive Medicine

A Compendium of Treatment and Prophylaxis, Original and Adapted

Experimental Pneumectomy.—George J. Heuer and George R. Dunn (*Bulletin of the Johns Hopkins Hospital*, February, 1920) performed total pneumectomy on twenty-three dogs, with thirteen recoveries and ten deaths occurring from four days to two months after the operation. Six of the fatalities were caused by an epidemic of distemper among the dogs in the earlier part of the work. At autopsy none of these dogs showed infection of the parietal wound or pleura or leakage from the bronchial stump. The following causes were responsible for the deaths of the rest: Simple pneumonia unassociated with other evidences of distemper, one; starvation, two months after operation, one, with remarkable emaciation at autopsy, but no other cause for death; acute pneumothorax, two animals, as a result of leakage from the bronchial stump. In one of these failure to secure an adequate closure of the bronchial stump was intentional; in the other necrosis of the bronchial wall followed the application of an intentionally flattened, not rolled, metal band. The animals were kept under observation in some instances for a year, and were returned to the yards with the other dogs as soon as they recovered from the operation. They were apparently active, healthy, free from dyspnea, and held their own with the other animals. The technic for the lung excision is given in detail, together with various methods for treating the bronchial stump.

Treatment of Pneumonia.—J. W. Preston (*Virginia Medical Monthly*, November, 1920) notes that while type I serum is curative in type I cases, it has not come into general use because of the existing impracticability, outside of large centres, of securing prompt typing of pneumonia cases, as well as because of the minute detail necessary in the administration of the serum. Further, type I represents less than one third of all lobar pneumonias, and the great majority of cases in the past two years have been, not lobar, but bronchopneumonia. In most cases in which a severe type of pneumonia develops, the author has noticed some basis for it either in loss of sleep, physical exhaustion, mental upset, or an inability or unwillingness to remain quiet in bed in a room maintained at a comfortable temperature. The picture in severe bronchopneumonia is one of exhaustion of the vegetative nervous system, resembling that of shock, and the author's best results have been obtained from treatment such as would forestall or benefit shock. Such treatment excludes severe purges, any except the smallest doses of coal tar products, sponge baths, cold air, and all exertion, whether mental or physical. Of the drugs, opium, preferably in the form of codeine by the mouth, or one twelfth grain doses of morphine given hypodermically at intervals sufficiently short to control cough and restlessness, proved of greatest value. As adjuvant, atropine is a close second, but only in doses of one six hundredth grain, given with the opiate, e. g., hourly, until

some effect is noted, then at longer intervals. To sensitize the heart to digitalis action it seems advisable to begin with a small dose of the tincture, e. g., ten drops three times daily. This dose does not upset the digestion, yet is sufficient, should the circulation weaken, to enable one quickly to digitalize the patient by giving one half to one dram at a dose, repeated as indicated. A frequent cause of cardiac and respiratory embarrassment is gaseous distention. The diagnosis of pneumonia having once been established, frequent examination of the abdomen is strongly indicated. In addition to enemas and turpentine stupes, pituitrin is of the greatest service. It should be given early and at regular intervals in cases showing a marked tendency to distention. A small rectal tube introduced and allowed to remain in severe cases also affords pronounced relief. As a quick pick-up for the heart and for relief where there is an asthmatic tendency, adrenalin has seemed to aid, but its action is more transient. Hot mustard pastes applied early over the entire chest are a great help. Intravenous administration of glucose is destined to be of great assistance in patients not annoyed or upset by it, especially those with a tendency to acidosis.

Purpura and Meningococcic Septicemia.—P. Lereboullet and J. Cathala (*Paris médical*, October 30, 1920) point out that meningococcic septicemia is by no means a rare condition. In recent years cerebrospinal meningitis seems to have assumed purpuric and septicemic characteristics more frequently than before. The disorder may appear as a simple infectious purpura which continues clinically mild until the terminal meningeal symptoms supervene. Any case of rheumatoid purpura of obscure origin should lead at once to the suspicion of meningococcic septicemia. For the early detection of this type of purpura consideration should be given to the question whether the purpura appeared in a locality in which cerebrospinal meningitis had previously occurred. In one of Netter's cases the coexistence of cerebrospinal meningitis in the sister of a little girl of six years exhibiting purpura led to the discovery of the meningococcic origin of the latter. On lumbar puncture, cloudy fluid points definitely to meningococcic infection. A clear fluid does not, however, exclude such infection. A blood culture should be made on bouillon and ascitic fluid, but is often negative. Under exceptional conditions meningococci may be found by staining tissue sections of a purpuric spot, or the organism found in smears of bloody fluid from such a spot; or, again, it may be demonstrated in the fluid contained in the seropurulent vesicles sometimes formed on the surface of a pètechia. The meningococcus may likewise be sought in the pus from definite foci of infection accompanying the septicemia, as in suppurative arthritis or iridochoroiditis. In severe cases, even where the meningococcus cannot be identified, antimeningococcic serum should be given by intramuscular injection. If a polyvalent serum

is unavailable, B meningococcus serum should be chiefly used, as the B organism has been found in nearly all the cases of this type so far reported. The serum should be administered as soon as the suspicion of meningococcic infection arises. These cases are more frequently fatal than the ordinary forms of cerebrospinal meningitis.

Presence of the Tubercle Bacillus in the Blood Stream.—Sabathé and Buquet (*Presse médicale*, October 27, 1920), to demonstrate the tubercle bacillus in the circulating blood, collect six mils of blood in a test tube and allow it to coagulate. After the clot has contracted, some of the fluid is withdrawn by means of a pipette placed in contact with the clot and smears made and stained by the Ziehl method. Tubercle bacilli will be found in the blood of tuberculous patients by this procedure.

Sodium Citrate in the Treatment of Pneumonia.—L. Cheinisse (*Presse médicale*, February 14, 1920), commenting on Weaver's pneumonia treatment with large doses of sodium citrate, notes that observations with the viscosimetre on pneumonia cases would appear to justify the citrate treatment. The viscosity of the blood has almost invariably been found high in pneumonia, especially in comparison with the hemoglobin values. Hence the seeming advantage of acting remedially upon the viscosity and restoring it to normal. Sodium citrate may also be held to act by reducing the coagulability of the blood and by increasing its alkalinity, which is lowered in pneumonia.

The Bacteriology of Colitis.—H. L. Lyon-Smith (*Lancet*, June 12, 1920) considers that the usual methods of investigating the stool in colitis for the purpose of identifying the chief organism producing the inflammation are unsatisfactory. He points out that we are anxious to learn what bacteria is present in the mucosa rather than in the feces. In order to get as accurately as possible this information, he first gives a Plombière douche of a pint of warm water. Then a second injection of two or three pints is given and retained for six minutes while the patient is moved from side to side. The washing is received in a clean receptacle and is searched for particles of mucus which are placed in a sterile container to be kept for such examinations as seem necessary.

Control of Epileptic Seizures.—Irving J. Sands (*State Hospital Quarterly*, February, 1920), in discussing the control of epileptic seizures, gives the following summary of his findings: 1. Epilepsy in the present state of information might be best regarded as a disease entity, as nothing might be gained from including under the same caption those forms of convulsions which are occasioned by definite etiological agents and in which constant and definite pathological changes are seen at necropsy. 2. To combat convulsions the drug giving the most satisfactory results is luminal. A review of the literature and citation of cases are given to prove its usefulness and efficacy in the management of this disease. 3. Ordinary hygienic measures, proper exercise, hydrotherapy, rigid attention to the diet and to the bowels, are indispensable agents in controlling epileptic seizures.

The Dose of Iron.—Albert Adler (*Schweizerische medizinische Wochenschrift*, July 29, 1920), who is apparently Naegeli's assistant, discusses the dose of iron to be employed in chlorosis. In bad cases he gives from three to ten doses a day of 0.1 gram of reduced iron. The improvement in the blood reaches its acme in about three weeks. He is more enthusiastic than Naegeli concerning the benefit to be expected in the very bad cases.

Action of Iron in Chlorosis.—Naegeli (*Schweizerische medizinische Wochenschrift*, July 29, 1920) considers that chlorosis is in fact a torpor of the blood formation which differs in degree in different cases, and can scarcely be overcome in the worst. Iron, when given in sufficient doses, acts as a stimulant, particularly of the bone marrow. In this it excites a stormy reaction, which causes quantities of young elements to be thrown into the blood. Not only the hemoglobin elements, but the whole of the bone marrow appears to be stimulated.

The Milk Situation.—Howard Swift (*Boston Medical and Surgical Journal*, April 29, 1920) says that milk in a raw form often endangers the health of infants. The amount of immunity that is transmitted through infected milk for tuberculosis is an unknown quantity. Pasteurization, as called for by the present law, may not be so safe as is generally believed. There is a considerable loss of life and impaired health directly attributable to the use of infected dairy products. Under the present demand by the public, the producer cannot afford to manufacture a cleaner and better product. He urges a campaign to secure tuberculosis free milk.

Epidemic Hemeralopia Due to Lack of Vitamines.—R. Tricoire (*Paris médical*, February 21, 1920) states that epidemic hemeralopia may occur in the human subject when certain vitamins of group A are lacking from the diet. The condition may be classified as an avitaminosis, in conjunction with scurvy, which is due to lack of substances of the same type—liposoluble vitamins. Like other avitaminoses, epidemic hemeralopia develops only after the deficient diet has been employed for a certain period of time. Apparently the avitaminoses set in only after an actual incubation period, which, in the case of epidemic hemeralopia, is probably from three to four months. The hemeralopia disappears rapidly after the vitamins are supplied.

Diabetes in Wartime.—D. Gerhardt (*Schweizerische medizinische Wochenschrift*, February 19, 1920) says that during the war the food conditions were more unfavorable for diabetics than for any other class of patients, so physicians looked for a marked change for the worse in them. But these fears were not realized. On the contrary, the dietetic restrictions had a favorable influence, which he ascribes to the low calorie content of the food, the small proportion of albumin, and the large amount of vegetables eaten. Meat and cheese were not absolutely forbidden, and the diabetics did better than they could have been expected to do on a strict antidiabetic diet without careful medical supervision. He is inclined to think that too little carbohydrate may do harm, as well as too much, and that the entire quantity of food should be limited.

Proceedings of National and Local Societies

AMERICAN PEDIATRIC SOCIETY.

Thirty-second Annual Meeting, Held in Highland Park, Ill., May 31, June 1 and 2, 1920.

The President, Dr. THOMAS S. SOUTHWORTH, of New York, in the Chair.

Segregation of Pneumonia.—Dr. THOMAS S. SOUTHWORTH, in his presidential address, declared that pneumonia was today one of the greatest endemic plagues of the world, and one for which less had been accomplished in the way of limiting its ravages than for any other malady of like import save pandemic influenza. This, he said, was not due to lack of interest in the problem but rather to its complications, since the processes we called pneumonia were several pathological entities of diverse etiology, and with somewhat loosely correlated clinical manifestations. Untiring zeal had been expended to find a remedy for the pneumonias, but the possibility of guarding against their inception had not been considered as clearly. Here the field was a wide one worthy of further patient study. One avenue not properly guarded was the exposure of susceptible individuals in dangerous propinquity to active cases of the disease.

It had long been recognized that pneumonias were caused by microorganisms of recognized pathogenic virulence, yet it had been the custom to treat pneumonias in the general wards of hospitals and to place about them in the home the ordinary precautions of the sick room. Segregation of such cases might have been practised by thoughtful individuals, but the idea had not found its way into the general medical conscience nor been advocated widely in our literature. Dr. Southworth said that for years he had insisted, when possible, upon the prompt isolation of the first cases of pneumonia among children having measles with a resulting limitation of the number of cases and had extended segregation to all the pneumonias. The real question was not whether the case for the individual infectiousness of the pneumonias was fully proved to the satisfaction of the most skeptical but whether, as physicians, they were individually to assume responsibility for permitting exposure in cases of pneumonia which they would not permit in many types of much less serious illness, the latter having been declared quarantinable while pneumonias thus far had not been. The obligation was imperative to anticipate the day, not far distant, when the movement to control the scourge of pneumonia might make the retention of such cases in a general ward as repugnant to our medical sense of propriety as the retention of a case of open tuberculosis.

Studies on Blood Sugar: The Effect of Blood on Picrate Solutions.—Dr. DAVID MURRAY COWIE and Dr. JOHN PURL PARSONS, of Ann Arbor, described experiments which they had made tending to show that blood contained substances other than sugar which induced a color change in the picrate solution employed in the modified Lewis-Benedict blood sugar method. Under normal con-

ditions these substances did not interfere with the established normal range for this method. Under pathological conditions several of these substances which showed the most marked influence were epinephrine, acetone, and diacetic acid. Creatinine might interfere but did so in a less marked degree if we considered the comparative sensitiveness of the picrate solution to these substances.

As picrate solution reacted to smaller quantities of acetone than were normally found in the blood, the question might well be raised, "Do not the acetone bodies of the blood contribute to the established normal blood sugar range for the Lewis-Benedict test?" Still another question might be asked: "As epinephrine in infinitesimally small quantities induces a color change in picrate solution, is it not possible that this substance when thrown into the general circulation, as is supposed to happen in emotional states, may induce a so-called hyperglycemia without mobilizing the glycogen stores of the liver?"

Epidemic Encephalitis Lethargica.—Dr. LINNAEUS E. LA FETRA, of New York, stated that cases of a disease accompanied by profound somnolence and lethargy had occurred at various times in sufficient number to have been regarded as epidemics. It was evident both from the difference in the lesions and also from the results of animal experimentation that poliomyelitis and epidemic encephalitis were distinct diseases. In his experience epidemic encephalitis had not followed influenza with sufficient regularity to warrant one in stating that it was caused by influenza, though influenza might possibly predispose the patient to infection or increase the virulence of the prevalent virus.

After reviewing the recent work of Loewe and Strauss Dr. La Fetra presented an analysis of eleven cases of encephalitis seen at Bellevue Hospital since January 1, 1920. Of these eleven cases four were fatal. There was no relationship between any two of the patients and they did not live in close proximity to each other. In only two was there any history of influenza. The symptoms were variable, but in most instances there was marked headache accompanied by occasional dizziness; vomiting occurred in about one half the cases; pain in the eyes and cheeks compelling drowsiness was present in most of the cases. When the disease was well under way the outstanding features were lethargy, general weakness, and ptosis or paralysis of the ocular or facial muscles, with double vision in several instances. Fever was usually very slight, and lasted for only a few days. The spinal fluid was under little or no increased pressure, and in some instances was perfectly normal. It was noted that in the fatal cases there was a higher white cell count than in those where recovery took place. In most cases globulin was present, and there was an increase in the number of cells. The highest number of cells was 275 in a fatal case; the average number, however, ranged from fifty to one hundred, all of which were mononuclears. The fluid was

sterile on culture. Recovery took place gradually, there being first a return to consciousness, then a diminution of catatonia and paralysis, and last of all the asthenia and ptosis disappeared. Undoubtedly, as in poliomyelitis, abortive, mild, atypical cases of the disease occurred, many of them probably being unrecognized. The disease had to be differentiated from tuberculous meningitis, poliomyelitis, cerebrospinal syphilis, brain tumor and meningism. The mortality of the disease was about the same as that of poliomyelitis. How great a proportion of the patients might later show damage to the brain it was too early to state. The treatment, until a specific serum was produced, was symptomatic.

Acute Cerebrocerebellar Ataxia.—Dr. J. P. CROZER GRIFFITH, of Philadelphia, presented three new cases of encephalitis and a résumé of a case previously reported, all of them pointing to an involvement of the cerebellum as well as the other parts of the brain. The first case exhibited incoordination, nystagmus, affection of speech, confusion of mind, increased knee jerks, but no paralysis. This patient made a rapid and complete recovery. The second case exhibited a staggering gait, dizziness, incoordination, no nystagmus or affection of speech. This child showed some incoordination three and three quarters years later. The third patient had a staggering gait, strabismus, nystagmus, vertigo, mental backwardness, affection of speech; normal eyegrounds. A year later the symptoms were still present but improved. The fourth case exhibited early symptoms suggesting encephalitis lethargica. During improvement marked incoordination and affection of the speech became manifest. Recovery was very slow. At last report the slow speech still persisted.

The conclusion reached from a study of these cases and of seventeen cases previously collected from the literature, was that this was not a common condition but that it occurred more frequently than was ordinarily supposed, in which acute hemorrhagic encephalitis involved the cerebellum and which might be designated acute cerebellar encephalitis. With this disease there were always combined symptoms indicating an involvement of the large brain as well, and for these the title cerebrocerebellar encephalitis or cerebrocerebellobulbar encephalitis was to be preferred. The degree to which the process involved one or another part of the brain varied, but in all cases there was a combination of the symptoms affecting both regions. The cause of cerebrocerebellar encephalitis varied decidedly. In the majority of cases previously reported some infectious disease had preceded the attack. This was true in two of the cases reported in the paper; in the other two no such connection could be discovered. The symptoms were those mentioned in the cases cited. The prognosis so far as life was concerned seemed good. That clinical evidence of the disease would not persist was uncertain, but so far as statistics went it would appear that the disease would leave no traces in the majority of instances. Lumbar puncture was done in all the cases reported by the writer and was always negative.

The Significance of Xanthochromia of the Cerebrospinal Fluid, with Report of a Case in a Premature Infant.—Dr. ISAAC ABT, of Chicago, said this case was reported because of the yellow coloration of the spinal and ventricular fluid. The infant was thirty-seven days old at the time of death and was of eight months' gestation. Interest also attached to the case because of the occurrence of bronchopneumonia and pyelitis. Xanthochromia was found in the complete syndrome of Froin and in the incomplete syndrome of Nonne. Froin's syndrome included massive coagulation, while Nonne's syndrome included increased globulins, but not massive coagulation. The importance of cell increase was mentioned by some and ignored by others. Considering xanthochromia by itself was the simplest way of elucidating the subject. It was most frequently found in cases of tumor, inflammation, or trauma, cutting off part of the spinal canal. The cul-de-sac so formed usually contained a yellow fluid which coagulated *en masse*. The pigment comes from the blood ultimately. In addition to the process of transudation which occurred in a cord compression, it was readily seen that any condition which permitted red blood cells to escape into the spinal fluid might produce a yellow color when the red cells had been dissolved and the hemoglobin freed. The globulins were always increased in a yellow fluid, whether massive coagulation occurred or not. It might be due to transudate in the case of a tumor pressing on the cord; exudate in the case of a meningeal inflammation, and hemorrhage in cases due to trauma, inflammations, and tumors.

Increased cell count occurred in cases of meningitis, and was also found in cases of tumor and hemorrhage. In the last case the presence of red cells usually excluded other conditions, although blood might be present as a concomitant finding in tumors and meningitis. Pellicle formation was of little importance, was usually found in meningitis, and had been reported in a case of tumor without meningitis. Where the process had been of short duration and where the compressions had not been sufficient, massive coagulation might not occur. In fact, many writers stated that Nonne's complete syndrome was merely a precursor of Froin's complete syndrome. Some cases of Nonne's syndrome probably never reached Froin's stage. Similarly conditions causing hemorrhage might never give sufficient plasma and fibrin to cause coagulation. Another class of cases causing a yellow spinal fluid was that type associated with red cells in the fluid. Many considered this a separate syndrome and applied the name erythrochromia to it.

The case reported was that of a child brought to the hospital for special feeding. About the fourteenth day the temperature rose to about 106° F. and the child was seized with severe convulsions. The urine showed pyelitis, and upon examining the lungs patches of bronchopneumonia were found. The convulsions and the urinary and pulmonary findings persisted until the end. The anterior fontanel was tense and bulging. On the thirtieth day spinal puncture yielded four c. c. of distinctly yellow fluid. The fluid was clear but the first two

cubic centimetres yielded a filmy pellicle. The second tube containing two c. c. did not change. Three days later the right ventricle was punctured and twenty c. c. of yellow fluid was removed. In both specimens of fluid there were red cells, increased globulin, and increased cell count, most of which were polymorphonuclears. The child died on the thirty-seventh day and autopsy showed a fibrinous, hemorrhagic meningitis and encephalitis. There were subpial hemorrhages, marked internal hydrocephalus, subacute pyelitis, and bronchopneumonia.

Nature of the Reducing Substance in the Urine of Children Suffering from Nutritional Disorders.

—Dr. OSCAR M. SCHLOSS, of New York, said that the work of Langstein and Steinitz had led them to believe that this reducing substance was lactose or galactose. Experiments which he had carried out did not confirm this finding. The only reducing substance which he had found constantly present in perceptible amounts was glucose. There was usually a nonfermentable reducing substance similar to that found in normal urine. This might be lactose, but its amount was too small to identify it with certainty.

Bodily Mechanics in Relation to Cyclic Vomiting and Other Obscure Intestinal Conditions.—

Dr. FRITZ B. TALBOT and Dr. LLOYD T. BROWN, of Boston, stated that faulty bodily mechanics had been responsible for a great loss of efficiency among adults during the war. Many men broke down in France under the strain of training and war. Such large numbers of men could not be sent home and they were therefore given special physical training. This brought back eighty per cent. to full physical efficiency. Of seven hundred men entering Harvard University, twenty per cent. had good bodily mechanics and eighty per cent. had bad mechanics. The human machine might be far from the standard type and might yet be very efficient in spite of physical disability. Poor bodily mechanics were more easily prevented and corrected in childhood than in adult life, and time spent on training at this age produced more far reaching results than the same time spent on adults. Three abnormal conditions which came in children with poor bodily mechanics were so frequently relieved by correcting the posture that posture must be considered the principal cause or the principal contributing cause of these conditions, granting that all other causes were ruled out. Correcting improper posture often corrected chronic constipation, hastened the cure of recurrent vomiting, and the cure of certain types of acute abdominal pain in children.

An Epidemic of Hemorrhagic Diarrhea Due to the Streptococcus Mucosus.—Dr. A. D. BLACKADER, of Montreal, said he was summoned to Waterloo, sixty miles southeast of Montreal, because of an epidemic of diarrhea. The first case occurred on March 22d, five on the following day, and since then the number had increased to sixty-five in the town itself and there were other cases within a short radius. Adults composed about one fourth the entire number. The larger proportion of cases, however, occurred in children under the age of six

years. The attack began abruptly with high fever, nervous symptoms, and vomiting, and diarrhea set in early. Mucus and blood appeared in the stools and the amount increased rapidly as the stools became more frequent, and in the severe cases seemed to form almost all of the stool. Blood was a prominent feature in the stools in sixty per cent. of the cases. The attack lasted from a few days to twelve, fourteen or even twenty-one days. The temperature in the severe cases went as high as 106°, while in the milder cases it was comparatively low, 100° or 102° F. In a few cases there was no rise above normal. Notwithstanding the severity of the cases no deaths occurred. Examination of the stools in one case showed large numbers of chains of *Streptococcus encapsulatus*, and about an equal number of colon bacilli. There were very few other bacteria. There were no organisms of any of the types of *Bacillus dysenteriae*. In a second case examined there were large numbers of the *Streptococcus mucosus*. In searching for the origin of this epidemic an inspection had been made of the milk supply, but a careful study of the situation seemed to eliminate milk as the source of infection. The water supply came from springs and several of these were thought to be insufficiently protected against contamination. The epidemic occurred after a few days of pronounced warm weather when the snows melted rapidly on a frozen soil. The presence of such large numbers of the *Streptococcus mucosus*, associated with other streptococci and equal numbers of colon bacilli, and the absence of any *Bacillus dysenteriae*, indicated that the streptococcus must be regarded as the chief organism in the production of the epidemic.

Phlyctenular Ophthalmia and Its Relation to Tuberculosis.

—Dr. BORDER S. VEEDER and Dr. T. C. HEMPELMANN, of St. Louis, presented this study which was read by Dr. Hempelmann. He stated that there was a widespread impression among pediatricists that phlyctenular ophthalmia was closely associated in some way with tuberculosis, but many ophthalmologists were as yet unwilling to concede this relationship. In an effort to gather additional clinical evidence on this point, 196 children with phlyctenular disease were subjected to a careful study to determine the possible presence or absence of tuberculous infection. The study revealed an intimate association between the two diseases. Skin tuberculin tests were positive in over ninety-two per cent. of the cases. The results of the complement fixation test for tuberculosis were strikingly similar to those obtained in cases of proved tuberculosis. Tuberculous lesions involving other organs than the eye were definitely demonstrable in over half, and seemed probable in almost two thirds of the cases. Children observed over periods of one year or more showed an even greater proportion of tuberculous lesions, more than four fifths of this series giving such evidence. Cough, malnutrition, and history of exposure to other cases of tuberculosis were frequent. No other points were brought up in the study which would seem to have a bearing on the etiology.

(To be continued.)

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Original Communications

VARIATION IN THE RATE OF INFANT MORTALITY IN THE UNITED STATES BIRTH REGISTRATION AREA.*

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Until recently it has been impossible to discuss on any accurate or satisfactory basis the infant mortality of any considerable portion of the United States. This difficulty has arisen from the fact that except in a few localities, notably some of the New England States, there has been in the past no adequate system of birth registration. The most accurate practical method of presenting the subject of infant mortality is to relate the number of deaths of infants under one year of age in a given time unit to the number born in the same time unit. Consequently one needs accurate birth statistics before infant mortality can be adequately discussed.

It is a matter of great satisfaction to everyone interested in the subject of infant mortality that at last there is well established a birth registration area for the United States, and four annual reports on birth statistics of this area have been issued to date by the census bureau. We are well embarked now on the policy of adequate birth statistics for the country and unquestionably within a comparatively few years the birth registration area will cover the major portion of the country as the death registration area now does. In the short period since the birth registration area has been established its growth in extent has been gratifyingly rapid. The first report on birth statistics for the year 1915 comprised data from an area including approximately thirty-one per cent. of the population of the country. The 1918 birth statistics report gives data from an area including fifty-three per cent. of the population. This furnishes a sufficient volume of material so that one may begin the mathematical analysis of some of the problems of infant mortality with some assurance of reaching valid conclusions.

The purpose of the present paper is a modest one. It aims simply to present briefly some of the facts of variation in rate of infant mortality in different geographic or demographic units of the population. The first step in the solution of any

problem is obviously a clear definition of the problem itself. We shall see, as we pass from city to city, town to town, or rural county to rural county, that the rate of infant mortality varies greatly. In a hypothetical, visionary community where the most perfect administrative control over infant mortality possible or conceivable had been attained this variation would largely disappear, the only residue of diversity between communities in respect of infant mortality being such as arose purely by the operation of chance, that is, from random sampling. Now, with the actually existing condition of variation between different communities in respect of infant mortality, it is obvious that there must be particular and presumably determinable reasons for each particulate difference which exists. Operating on a basis largely of empiricism and *a priori* reasoning, efforts to reduce infant mortality have in the past been attended with considerable success. Also, with the advance of general sanitation the death rate under one year of age has fallen enormously. Greenwood (1) quotes some interesting figures on the point from Farr, which we may well reproduce here to show how great has been the improvement.

Period	PERCENTAGE DEATHS UNDER FIVE YEARS.				
	1730-49	1750-69	1770-89	1790-1809	1810-29
	74.5	63.0	51.5	41.3	31.8

But after such a decline as these figures indicate the continuation of the business offers a difficult problem to the administrative official, whose procedures are grounded essentially only on the two pedestals of what he thinks has worked in the past and what he believes logically ought to work. The easy part of the conflict has happened and is in the past. To continue the good fight with the same relative measure of success, one presently must needs know more precisely than is now known the pattern of the causal nexus which controls and determines the rate of infant mortality. And it is real knowledge, not *a priori* logic, that is wanted. Let a single example illustrate. It has been maintained that excessive infant mortality is primarily the resultant of the so-called "degrading influences" of poverty, and such a contention stirs a warmly sentimental feeling of agreement in the minds of the well-meaning public zealous to do good. This relationship obviously ought to be true, therefore to a too common type of mind it must be and is true. But Greenwood and Brown (2) in what may fairly be regarded the most thoroughly sound.

*Papers from the Department of Biometry and Vital Statistics, School of Hygiene and Public Health, Johns Hopkins University, No. 18. Read before the Eleventh Annual Meeting of the American Child Hygiene Association, St. Louis, October 11-13, 1920. A preliminary and condensed abstract of a more detailed investigation of the subject to be published shortly.

critical, and penetrating contribution which has yet been made to the problem of infant mortality are unable "to demonstrate any unambiguous association between poverty . . . and the death rate of infants."

The plain fact is that before control or ameliorative measures can be applied with the maximum of efficient economy to the general public health problem of infant mortality we must know a great deal more than we now do about the factors which induce spatial and temporal differences in the rate of that mortality. But first we must get an adequate conception of the magnitude and character of the differences themselves. Let us, therefore, turn to the examination of the facts regarding variation in infant mortality in the United States birth registration area.

VARIATION DATA.

In this work we have studied the variation in the rate of infant mortality (deaths to the thousand births) for the following groups:

1. Total population in cities of population of 25,000 or over in 1910.
2. Total population in cities of under 25,000 population in 1910.
3. Total population in rural counties of registration states.
4. White population in cities of population of 25,000 or over in 1910.
5. White population in cities of under 25,000 population.
6. White population in rural counties of registration states.
7. Colored population in cities of population of 25,000 or over in 1910.
8. Colored population in cities of under 25,000 population.
9. Colored population in rural counties of registration states.

In order to make possible a better appreciation of the nature of the frequency distributions a chart (Fig. 1) has been prepared. This shows for the year 1918 the frequency polygons for the total population of, a, cities of 25,000 and over, b, cities of under 25,000, and, c, rural counties.

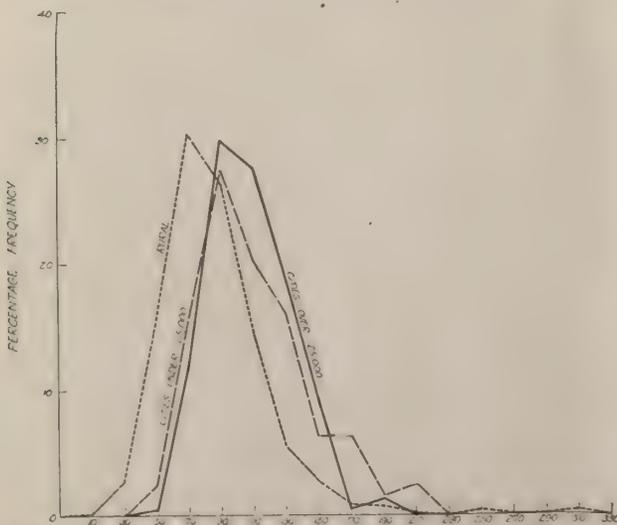


FIG. 1.—Frequency polygons showing variation in the rate of infant mortality in 1918 for the total population of, a, cities of 25,000 and over; b, cities of under 25,000; and, c, rural counties.

This diagram is fairly representative of all the distributions.

The most striking immediately observable feature of these distributions is the great range of variation which they exhibit. For example in 1918 the 236 cities of under 25,000 inhabitants showed infant mortality rates ranging all the way from the class 40-59 deaths to the thousand births to the class 300-319 deaths to the thousand births. The range of variation is even greater than this in the case of the distributions for the colored population. These extraordinarily large ranges of variation demonstrate perhaps more clearly than could be done in any other way the opportunity which exists for effective administrative control and reduction of infant mortality. If there are communities, as there are in plenty, showing infant mortality rates under a hundred deaths to the thousand births it suggests at once that it is possible if the right measures are systematically and effectively applied to reduce the infant mortality in those other communities showing very high rates to something like the level of these at present more fortunate communities.

In Table 1, are presented the chief physical constants¹ of the distributions of variation in infant mortality. These constants have been determined by the method of moments from the original raw data. (I am greatly indebted to my assistant, Mrs. Charmian Howell, for aid in the arithmetical work of this paper.)

The constants tabled are:

1. The arithmetic mean.
2. The median. This measures the value above and below which exactly half of the variates occur.
3. The standard deviation. This constant measures in absolute units the degree of "scatter" or variation exhibited by the distribution.
4. The skewness. This constant measures the degree of asymmetry of a frequency distribution. If a distribution is perfectly symmetrical on both sides of the mean so that if folded over upon the mean as an axis the two limbs would exactly coincide, the value of the skewness is zero.

From the data presented in Table I the following points are to be noted:

1. There is no certainly significant decline in the mean value of the rate of infant mortality during the four years covered by these statistics in any of the demographic units considered.

2. In 1918 there was a general tendency towards an increase in the mean rate of mortality over that which obtained in 1917. This increase is unquestionably to be attributed to the influenza epidemic of the autumn and winter of 1918. A careful examination of the rates by months will convince one that the mortality of infants increased materially during the period of the epidemic. Whether this increased number of deaths was truly to be charged to influenza does not concern us here. The important fact is that the rate of infant mortality markedly increased coincidentally with the existence of the epidemic. It is noteworthy that this increase in the infant mortality rate in 1918 is practically confined to the cities. The rural counties, whether

¹ For a very brief and summarized introduction to the modern mathematical treatment of frequency curves see Pearson, K. *Tables for Statisticians and Biometricians*, 1914, pp. lx to lxx. References to the basic literature on the subject will be found there.

for white or colored or total population, show little or no change in 1918 as compared with 1917.

3. There is no unequivocal difference in the mean rates of infant mortality in the larger as compared with the smaller cities. Considering the largest differences in mean rates for total populations in cities of 25,000 and over as compared with cities of under 25,000 there is no difference which is as much as even three times its probable error.

4. The mean rates of infant mortality are notably smaller in the rural than in the urban areas. This fact has, of course, long been well known. The first writer on vital statistics, in the sense in which we now understand that subject, Captain John Graunt, more than 250 years ago pointed out that rural communities exhibited generally a lower rate of mortality than urban communities. The difference between urban and rural rates of infant mortality is reflected just as clearly in the high absolute

that the greater the variation exhibited by a given class of the community in respect of infant mortality, the greater the chance of effective control and reduction of the average infant mortality by administrative measures. There can be no question that there is no field which offers so great opportunities in this direction as the colored population.

7. The skewness is seen to be positive in sign in every case but one. In that case (1916, cities over 25,000, total) the skewness is not significant in comparison with its probable error. With this exception the curves tend to tail off more gradually and farther towards the right end than towards the left end of the range. In other words, the rate of infant mortality in these different American demographic units tends generally to distribute itself in a substantially asymmetrical fashion about the mean, extremely high rates occurring more frequently than correspondingly low rates. This fact

TABLE I.

Constants of variation in rate of infant mortality (deaths under the age of one to the 1000 births)

Group		Year	Mean (2)	Median (2)	Standard deviation (2)	Skewness
Cities over 25,000 ¹ , Total	Total	1915	104.49 ± 1.78	102.76	26.14 ± 1.26	+ .3148 ± .0937
		1916	102.53 ± 1.67	103.24	24.69 ± 1.12	-.0786 ± .0848
		1917	99.58 ± 1.32	98.00	23.45 ± .93	+.2455 ± .0858
		1918	107.78 ± 1.41	105.50	25.07 ± 1.00	-.3237 ± .0800
Cities under 25,000 ¹ , Total	Total	1915	100.98 ± 1.68	97.95	30.81 ± 1.18	-.1934 ± .0657
		1916	104.23 ± 1.75	101.03	32.38 ± 1.24	+.2217 ± .0678
		1917	99.24 ± 1.32	94.74	29.94 ± .93	-.4840 ± .1197
		1918	111.61 ± 1.66	104.17	37.78 ± 1.17	+.5625
Rural counties, Total	Total	1915	83.07 ± .85	79.54	23.95 ± .60	-.3204 ± .1454
		1916	85.28 ± .90	82.15	25.94 ± .63	-.3536 ± .0509
		1917	82.01 ± .52	78.96	25.71 ± .37	+.2833 ± .1157
		1918	84.43 ± .57	80.97	28.40 ± .40	+.3328 ± .0409
Cities over 25,000 ¹ , White	White	1917	92.22 ± 2.02	92.14	15.60 ± 1.43	.....
		1918	102.59 ± 2.00	99.23	15.42 ± 1.42	.....
Cities under 25,000 ¹ , White	White	1917	98.46 ± 2.75	97.50	20.82 ± 1.95	.....
		1918	114.62 ± 4.17	113.33	31.49 ± 2.95	.....
Rural counties, White	White	1917	86.21 ± 1.07	84.24	24.15 ± .76	-.1799
		1918	85.90 ± 1.27	83.75	28.90 ± .90	-.2802 ± .0650
Cities over 25,000 ¹ , Colored	Colored	1917	202.59 ± 8.88	194.00	68.45 ± 6.28	.....
		1918	216.67 ± 11.15	214.00	85.87 ± 7.88	.....
Cities under 25,000 ¹ , Colored	Colored	1917	213.08 ± 9.92	228.00	74.96 ± 7.01	.....
		1918	217.69 ± 11.46	225.00	86.65 ± 8.10	.....
Rural counties, Colored	Colored	1917	134.76 ± 2.55	127.25	57.37 ± 1.80	+.4984
		1918	147.26 ± 2.92	134.59	66.15 ± 2.06	-.5819

¹ In 1910.

² In concrete units, i.e. rate of deaths under 1 per 1000 births.

rates of the colored population as it is in the lower rates of the white population.

5. The mean rates of infant mortality are, roughly speaking, something like twice as high for the colored population as for the white population in each of the demographic units considered, and at all times. This again is a fact in general well known, but here we have precise figures on the point, with probable errors, which show definitely how tremendously poorer the negro baby's chances of surviving the first year of life are than the white baby's.

6. The cities of over 25,000 exhibit distinctly less variation in respect of infant mortality than do either the smaller cities (under 25,000) or the rural counties. The smaller cities and the rural counties exhibit about the same degree of variation relative to their means, but absolutely, in terms of standard deviation, the rural counties show less variability than the cities under 25,000. The colored distributions exhibit a much higher degree of variation in respect of infant mortality however measured, whether absolute or relative, than do the white populations. In general, it may fairly be assumed

might perhaps be taken to indicate that the task confronting the administrative control of infant mortality in the United States and yet to be accomplished is even greater than what has already been accomplished in the past, great and worthy of commendation as that is.

DATA ON THE LIMITATIONS TO ADMINISTRATIVE CONTROL OF INFANT MORTALITY.

We have seen that there is a high degree of variation in the rate of infant mortality as we pass from community to community. Some communities have infant mortality rates several times higher than those prevailing in other communities of the same size. This creates the presumption at once that proper administrative activity might reduce the rates of these abnormally high communities to a level commensurate with those found in the lower group. It is the purpose of this section of the paper to examine this presumption critically.

At the start it is evident that there are some causes of infant mortality which are, in their very nature, beyond hope of effective practical human control. Thus, children born with marked congenital hydrocephalus will presently die, in spite of

anything the health officer can do, no matter how active and intelligent he may be. There are many other causes of death falling in essentially the same category in this respect.

Not as any final or dogmatic settlement of the matter, but rather as a tentative first approximation made for the purpose of seeing whether any suggestive lead may appear, I have ventured to attempt to classify the principal causes of mortality in the first year of life into two groups. The first of these groups aims to include those important causes of infant mortality which are either, a, actually now effectively controlled by the efforts of health officials, either directly or indirectly through general sanitary and hygienic improvements, or, b, are obviously capable theoretically of control and amelioration if sufficient pains be taken. The second group aims to include those causes of infant deaths which are, in the nature of the case, out of the present range of effective practical, direct control or amelioration. Let us see what such a classification, to a first approximation, looks like.

TENTATIVE CLASSIFICATION OF PRINCIPAL CAUSES OF INFANT MORTALITY.

<i>A.—Causes of death actually now well controlled, or capable theoretically of direct control in greater or less degree.</i>	<i>B.—Causes of death not now capable practically of direct control.</i>
Measles	Tuberculosis of the lungs
Scarlet fever	Tuberculous meningitis
Whooping cough	Other forms of tuberculosis
Diphtheria and croup	Syphilis
Dysentery	Organic diseases of the heart
Erysipelas	Malformations
Tetanus	Premature birth
Meningitis	Congenital debility
Convulsions	Injuries at birth
Acute bronchitis	
Pneumonia	
Bronchopneumonia	
Diseases of the stomach	
Diarrhea and enteritis	
External causes	

One realizes that it is a bold thing even to set down such a classification as the above. It is certain to stir up the rancor of extremists in both directions. But extremists are nearly always wrong. Calm and unprejudiced persons will admit that some such classification as that here attempted is possible. Perhaps some further discussion of this classification may make clearer its point of view, and may win at least that measure of agreement with it which will at least permit the consideration of the discussion of its consequences which follows.

Taking column A first, presumably no competent health official would deny that the first five diseases in the list (measles, scarlet fever, whooping cough, diphtheria and croup, and dysentery) have been, can be, and are in greater or less degree effectively controlled in respect both of their incidence and their mortality. With this same group clearly belongs also diarrhea and enteritis, and convulsions, on the justifiable assumption that in the vast majority of cases convulsions in infants are consequent upon violent enteric infections, which clearly belong in the controllable class. Diseases of the stomach, as causes of death under one year of age, again in the vast majority of cases undoubtedly mean infection—filth diseases, in short—which come in the same category, so far as concerns control, as diar-

rhea and enteritis. Regarding the rest of the diseases in the A group (erysipelas, tetanus, meningitis, acute bronchitis, pneumonia, bronchopneumonia, and external causes), the point of view which led to their inclusion here is as follows: If the environmental conditions surrounding the infant in the community and in the home, and the care given it, were made as favorable as they might be made, and actually are in the homes of the hygienically intelligent well to do, the death rate from each of these causes would be enormously reduced relatively in comparison with what it actually is. As a matter of fact, visiting child welfare nurses are doing a mighty work in just this direction in many communities. They teach parents how to care for their infants, protect them from these infections, and nurse them to a non-fatal issue in many cases if they do get infected. No one who knows at first hand what child welfare public health nursing is actually accomplishing in these directions will question the putting of these diseases in the controllable column. Their mortality rate can be materially reduced if communities will take the trouble to go intelligently about it.

Now for the B column. The first three items are the various forms of tuberculosis. The fanatic will no doubt promptly and violently assert that nothing is so easily and readily controllable as these. But let us make haste slowly and remember certain things: First, that we are here talking about deaths under one year of age, that is fatal tuberculosis in the first months of life; and second, that our classification premises, in specific and stated terms, direct control, that is, control through agencies now capable of being brought to act directly upon the infant or his environment. Is any competent and experienced health officer prepared seriously to assert that he can, by measures applied to the infant or his environment, significantly reduce the mortality from tuberculosis in infants under one year of age? If anyone has the temerity to make such an assertion the instant demand will be for his evidence. It is, of course, recognized that the infant mortality rate from tuberculosis may theoretically be reduced, and presumably some time will be, by reduction of the prevalence of adult tuberculosis. But this is beside the point for present consideration, for reasons stated above, and from the further fact that administrative measures are not, in reality, controlling or ameliorating the infant mortality from tuberculosis.

About fatal congenital syphilis, fatal congenital organic diseases of the heart, congenital malformations grave enough to be fatal in the first year of life, and fatal congenital debility, there will probably be no dispute. Regarding premature birth, and injuries at birth, much the same reasoning applies, but with the additional consideration that presumably intelligent prenatal education of the mothers and improvement of prenatal environmental conditions would reduce these mortality rates in some unknown, but probably not very large degree. There is no tangible evidence that these causes of death are in effect administratively controlled in any appreciable degree in this country at this time.

Finally, it should be said that one occasionally

or amelioration at the present time, exhibit less than half as much variation in the rate of infant mortality for which they are responsible, as we pass from city to city or from state to state, as do

TABLE IV.

FREQUENCY DISTRIBUTIONS OF VARIATION IN RATES OF MORTALITY UNDER ONE PER THOUSAND BIRTHS FOR, A, CONTROLLED, AND, B, NONCONTROLLED CAUSES.

Rate	Cities			States		
	A. Causes	B. Causes	All Causes	A. Causes	B. Causes	All Causes
15-24	2	..	..	3	..	..
25-34	5	1	..	3	2	..
35-44	9	16	..	7	11	..
45-54	13	13	..	3	7	..
55-64	2	5	1	2	..	1
65-74	2	2	1	2	..	2
75-84	2	..	2	..	..	2
85-94	1	..	9	..	..	5
95-104	..	..	7	..	..	4
105-114	1	..	5	..	..	3
115-124	..	..	6	..	..	..
125-134	..	..	..	..	..	2
135-144	..	..	2	..	..	1
145-154	..	..	2	..	..	..
155-164	..	..	1	..	..	..
165-174	..	..	..	..	..	..
175-184	..	..	1	..	..	..
Totals	37	37	37	20	20	20

TABLE V.

VARIATION CONSTANTS FROM THE DISTRIBUTIONS OF TABLE IV.

Group	Mean	Median	Standard deviation
Cities, A, controlled causes.	49.46 ± 2.04	47.08	18.37 ± 1.44
Cities, B, noncontrolled causes	47.30 ± .90	46.15	8.09 ± .63
Cities, all causes	107.84 ± 2.75	102.86	24.78 ± 1.94
States, A, controlled causes.	42.00 ± 2.17	40.71	14.41 ± 1.54
States, B, noncontrolled causes	42.50 ± .83	42.27	5.52 ± .59
States, all causes	97.00 ± 3.03	95.00	20.07 ± 2.14

the class A causes of death, which are capable of administrative control. This relation is true, however the variation is measured. This is a novel result, of interest from several points of view.

In the first place, the suggestion lies near at hand that if the class A causes of death, which are controllable, show such great variation relatively as they do, it must mark an approximately equal variability in the zeal, intelligence, and efficiency of the administrative health officials of these communities. Anyone at all familiar with the organizations of municipal and state health departments in this country will find it extremely interesting to study in detail the entries of Tables II and III, noting how the class A (controlled) and the all causes rates fluctuate up and down, while the class B (non-controlled) rates stay, with a very few exceptions, so extremely constant. One will observe, with great satisfaction, what splendid work is being done in some communities in holding down to a low level the infant death rate from controllable causes. Table II forms a real justification of the faith that is in the public health official of vision. It shows that the infant mortality from controllable causes can be kept down to a low level, and is in some communities. In the following cities (seventeen out of thirty-seven) the rate of infant mortality from the controlled causes of class A is actually lower than the rate from the noncontrolled causes (class B):

New Haven	Cincinnati
Washington	Columbus
Worcester	Dayton
Grand Rapids	Toledo
Minneapolis	Providence
Albany	Richmond
Borough of the Bronx	Seattle
Borough of Queens	Spokane
Borough of Richmond	

These cities stand as examples of the fact that a considerable portion of the infant mortality rate can be effectively controlled on the basis of knowledge we now possessed.

SUMMARY.

This paper is a first biometric survey of the infant mortality statistics of the recently established birth registration area. It is to be regarded as preliminary to certain analytical studies of the problem of infant mortality now in progress in this laboratory. The chief results of the paper are first to set forth and discuss the chief analytical constants of variation in infant mortality in the different demographic units. This variation, which is large in amount, markedly and consistently skew in the positive direction, and markedly leptokurtic, defines and throws into high relief the fundamental public health or administrative problem of infant mortality. Why do the communities having rates of infant mortality higher than the mode occupy that position? Is it from causes capable of human control, or from causes beyond the present possibility of such control? A special preliminary analysis of the data for cities of over 100,000, and the registration states, indicates that causes of death capable of administrative control are chiefly responsible for the variation observed in the total infant mortality rate, while those causes of infant deaths which, for fundamental biological reasons, are incapable of being sensibly influenced or controlled at the present time by administrative measures, are a highly stable and constant factor, from community to community contributing little to the observed variability of the total infant mortality rate. In absolute terms, however, these causes of death not administratively controlled are responsible for roughly forty per cent. of the total infant mortality in the communities discussed.

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THE INFANT MORTALITY IN THE CITY OF WATERTOWN, N. Y.

During the Period of 1916 to 1919, Inclusive.

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Watertown, N. Y.

Prior to taking office as health officer of the City of Watertown a preliminary survey of the vital statistics of the city was made. This disclosed among other things that the infant mortality was somewhat higher than obtained in other cities in the state of the same class. After taking office the study was extended to include the period from 1916 to 1919 and this paper is based upon that study. It showed that there were 2,996 births exclusive of stillbirths of which there were 115 or three and seven tenths per cent. of all the pregnancies recorded during the period. The records show that

there were also ninety-four premature births or two and seven tenths per cent. of all the recorded pregnancies. It therefore appears that six and four tenths per cent. of all the pregnancies resulted in disaster. Of the 3,111 pregnancies recorded 110 or three and five tenths per cent. were attended by midwives or members of the family. The greatest number of such deliveries was thirty-three in 1917 and there has been a decrease since that time.

In the following table are shown the births, stillbirths and infant mortality for each year and also the average for the period from 1911 to 1915:

TABLE I.

Average from	Year	Births	Stillbirths	Infant mortality per 1000
1911 to 1915...	137
1916	685	29	130	
1917	718	28	120	
1918	765	30	125	
1919	728	28	88	

The increase in the rate for 1918 is due to the epidemic of so-called influenza in the fall of that year and it is to be noted that the rate was low all over the state in 1919. The average for the last four years is 115.75 or a reduction of fifteen and five tenths per cent. The rate for 1919 is thirty-five per cent. below that for the period from 1911 to 1915. We feel that these results are largely due to the child welfare work carried on by the Visiting Nurse Association with a small appropriation from the city, since July, 1915.

Watertown is essentially an American city, in which a considerable proportion of the population own their homes. There are, however, several large groups of foreign born, principally Italians. As it is frequently stated that the infant mortality in a community is largely due to deaths among the foreign population I studied the problem with this in view, using the birthplace of the mother as an index of nationality. The result is shown in the following table which is based upon 2,907 births and 362 deaths of infants, a mortality of 124 to the thousand:

TABLE II.

Infant mortality, Watertown, N. Y., from January 1, 1916, to December 31, 1919, by nationality of the mother.

Birthplace of mother	Births	Deaths of Infants	Infant mortality
United States	2,083	224	111
Canada	381	38	99
Italy	242	22	91
Austria - Hungary.	78	8	102
England, Wales, Scotland	46	6	130
Russia	24	0	0
Other countries....	54	94	

This surely does not show that the foreign element is in any way responsible for the conditions which are found in this city. We recognize that in some instances the number of births are so few that the statistics may be influenced thereby. It is not assuring to find that the highest rates are among the English speaking people and that the lowest is among the Italians.

A further study of this question is shown in the following table where are collected the percentages of the deaths by causes for each group of inhabitants of the city:

The Americans and Canadians show practically identical conditions. While it appears that premature birth is a more frequent cause of death amongst the Italians, they also seem to suffer more from communicable diseases. The comparatively low figures for diseases of the digestive system among the Italians is, in all probability, due to the fact that most of these children are breast fed.

TABLE III.

Percentage of deaths by nations

Nationality of mother	Premature birth	Diseases of the digestive system	Diseases of the respiratory system	Congenital malformations and debility	Communicable diseases	Accidents of birth	Other diseases
United States..	26	22	16	15	10	4	7
Canada	26	26	26	5	5	5	3
Italy	32	14	23	5	16	5	5
All other countries	19	28	14	23	10	0	5
Average for all countries	26	23	16	15	10	4	6

For all of the infant deaths during the period we find that twenty-six per cent. were due to premature birth, twenty-three per cent. to diseases of the digestive system, sixteen per cent. to diseases of the respiratory system, fifteen per cent. to congenital malformations and debility, ten per cent. to communicable disease, and four per cent. to accidents of birth. Following the first tabulation of these data the Visiting Nurse Association opened a prenatal clinic.

A further study of the problem is shown in Table IV, which presents the causes of death among children who lived less than a month, the neonatal infant mortality.

TABLE IV.

Cause of death	Percentage of deaths
Premature birth	47
Congenital malformations and debility....	20
Accidents of birth, including difficult labor..	9
Diseases of the digestive system.....	8
Diseases of the respiratory system.....	7
Communicable diseases	1
All other diseases.....	8
	100

This table is based upon 180 deaths and shows the seriousness of the problem. It shows that seventy-six per cent. of the deaths in this group are due to causes over which the health officials can exercise but little direct control. It is probable that a few of the premature children might be saved by an incubator room and it is hoped to have such a room in the near future. It is also probable that in a few cases prenatal care may reduce the number of premature births, especially among those who are syphilitic. However, prenatal clinics are new and in small communities are not very popular.

To aid the nurses who are engaged in infant welfare work the percentage of infant mortality for each month from 1916 to 1919 was studied, and is shown in the following table:

Month	Percentage of mortality
January	8.4
February	6.6
March	9.2

Month	Percentage of mortality
April	9.2
May	8.7
June	8.9
July	8.9
August	10.5
September	9.8
October	7.1
November	6.4
December	7.6

This shows two peaks, the highest in the summer and early fall, due to diseases of the digestive system. Of seventy-eight deaths from such diseases, forty-eight occurred during July, August, September, and October. The second peak occurs in the spring, and is due to diseases of the respiratory system, the highest number of deaths from this cause occurring in May. As a solution of the problem we have adopted the following measures:

1. Extending the infant welfare work.
2. Having a nurse visit all new babies in sections where it is believed her services will be of value.
3. A prenatal clinic.
4. A campaign against the fly.
5. Abolishing as many outside toilets as possible, and rendering others flyproof.
6. Campaign of education, consisting of frequent articles in the local papers regarding infant mortality, and the publishing of the monthly statistics regarding infant mortality.

UNAPPRECIATED AGENCIES IN THE DEFECTIVE DEVELOPMENT OF CHILDREN.*

BY CHARLES GILMORE KERLEY, M. D.,
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All those individuals who had taken no interest in children or young people, other than in their immediate family or in those of their friends, sustained a decided shock when the reports of the various examining boards for recruits in the late international war were made public. From forty-five to sixty-five per cent. were rejected, with poverty having little to do with the case in many instances. It was for the first time realized how sadly remiss we had been in our care of children. That the greatest national asset is a strong, vigorous race no one can deny. At the age of seven years the boy is seven tenths the man and the girl seven tenths the woman. If errors in development from whatever cause exist at this age they will never be entirely eradicated. Evidences of this is apparent in the physical condition of those who have grown up on the continent during the war.

Miss Julie Lathrop reports of her recent investigation in Europe as follows: "In Prague, the capital of Bohemia, I went one day to a paper box factory whose workers there, as in the United States, are chiefly young girls. All of the party noted the small stature but mature faces of the girls. Most of them were in the middle teens, but they looked younger until you saw their faces. The manager said: 'Yes, it is so; we always had some girls who were small, but now they all appear to be small.'" Had these individuals been investigated

further, it would have been found that not only were they physically smaller but that they were generally inferior individuals. It would have been found that they lack resistance and have a diminished capacity for sustained effort, both mental and physical, all of which means that their labor output would be below that of a normal individual of corresponding age.

I shall make no attempt to cover all that relates to proper development. It is my hope to call your attention to certain factors that have an important bearing on this subject, generally unappreciated.

DEFECTIVE BREAST FEEDING.

It is a usual error to believe that breast feeding is always efficient and the best means of nourishment. Breast feeding may supply a substance entirely inadequate to the demands of the infant. Because good breast milk is superior to all other forms of food for the infant, it does not mean that inferior breast milk may be much less desirable than suitable substitute foods. Breast milk is a commodity, and there are varieties of breast milk as well as all other commodities. Every year I see a goodly number of cases of malnutrition in infants aged from six months to a year of age fed exclusively on the breast. We find these infants under weight in some instances, but the most usual evidence of defective nutrition will show itself in flabby muscles, secondary anemia, and beginning rachitis.

In spite of the best intention on the part of mother and physician, the child has been given a poor start. A considerable number of nursing women can supply the child adequately until the completion of the fifth month. Fewer can supply the baby adequately until the completion of the seventh month. After this period practically all babies in this country should have the advantage of additional feeding. Breast milk should be repeatedly examined as to quantity and quality during the nursing period, and the child kept under at least monthly supervision. A frequent error in breast feeding is to assume that the nourishment must be adequate. Kindly understand I am criticising defective breast feeding only. I have helped thousands of infants to better breast milk and for a longer period than they otherwise would have had. I appreciate also that there are exceptions to what I have already stated relating to the limitations of the nursing period. A mother, a former patient at the outpatient department of the Babies' Hospital, nursed five children almost continuously over a period of eight years, the nursing being interrupted but about six months during this time. The longest period of continuous nursing to come under my observation was in an Italian woman who nursed a boy three and a half years. She informed me that her milk had nearly failed after eighteen months, when she had a miscarriage, and the flow returned, when the nursing was continued much more satisfactorily than before.

COW'S MILK FOR OLDER CHILDREN.

After the eighteenth month in the average well child better growth will result with a reduction of the daily milk allowance to approximately twenty

*Read before the Southern Medical Society, November, 1920.

ounces daily, providing adequate nourishment can otherwise be furnished. Under conditions when other foods cannot be given and in suitable amounts a larger daily milk content in the diet may be of advantage to balance up a defective dietary. In such instances cod liver oil and iron should be given. I have seen a vast number of children with varying degrees of malnutrition who were taking from one to two quarts or more of milk daily. Almost invariably such children have a capricious appetite, they dislike other articles of diet largely because they are never given an opportunity to become real hungry and get acquainted with a wider range of foods.

Physically these children show poor muscle development, are pot bellied, constipated, underweight, and flabby. They are subject to frequent so-called bilious attacks. Blood examination seldom fails to show a secondary anemia because of the poor iron content in their milk food. Mentally they are irritable and difficult of management. Nature has fashioned a child for other foods than milk after and even before the cessation of the normal nursing period. Cow's milk never entered into the calculation. Advocating a quart of milk is bad teaching.

PERSISTENT ANEMIA IN INFANTS AND YOUNG CHILDREN.

I refer to those who show a hemoglobin content under thirty per cent. with red cells varying from 1,500,000 to 2,500,000, a condition which is not unusual. The child is pale, weakly, with very faulty development. Treated along the usual lines of feeding changes and drugs, the child makes little or no progress. These cases are not simple malnutrition, with anemia; they are cases of anemia with secondary malnutrition, and are most frequently seen in quite young infants. The treatment that has been most successful in my cases has been intravenous blood transfusion. The cause of the anemia is obscure. There is some radical defect in the blood making processes. The introduction of 120 to 150 c. c. of human blood into the circulation supplies the required stimulating agency. Food which before had only a sustaining value is now well assimilated and a satisfactory growth follows. In some young infants an astonishingly rapid increase in weight resulted. The following is my most recent case of this nature:

CASE I.—A boy four months old, weighing ten pounds, was brought to me because of anemia and marked malnutrition. Blood examination showed a hemoglobin content of thirty per cent. and red cells 2,005,000. Before any attempts at feeding were made, he was given 120 c. c. of the mother's blood intravenously by Dr. P. W. Bevans at the Babies' Hospital. The following day the hemoglobin content was fifty-five per cent. and the red cells 4,100,000. Sixteen days later a blood examination showed hemoglobin fifty-five per cent. and red cells 4,000,000. He was then put on a formula of fat, two per cent.; protein, one and a half per cent., and sugar, six per cent. He immediately began to gain, and six weeks after the transfusion he weighed thirteen pounds, with the blood conditions unchanged.

WASTED ENERGY.

Excessive activity, which means overwork, contributes its quota to the hordes of poorly developed children. The young child who awakens early and is busy all day in childish activities until seven or eight o'clock at night will not thrive as well as if there were reasonable restraint and a rest period after the midday meal of an hour or two and who retires at an early hour. I attempt to cultivate indolence in such natures.

Until the completion of the sixth year in all such children, and in many until the completion of the seventh year, there must be the daily midday rest if we are to secure proper growth. This is a rule that is invariably carried out among my patients. We often see the harmful effects of wasted energy in the second or third child whose strength is overtaxed in his efforts to keep the pace set by older brothers or sisters. This feature of wasted energy must always be investigated in children who come to us because of defective development. It is also to be remembered that stress is an important deterrent factor in the child's capacity for food assimilation. The overworked, tired child does not assimilate his food to the best advantage.

LOSS OF TIME.

A considerable number of children come to me because of inadequate growth who have been subject to frequent illness. When a child is ill, development is suspended. Such children are often the members of indulgent families who are not at all careful as regards meal time and the food given. Several illnesses will leave an appreciable mark upon the child. Recurrent attacks of indigestion every few weeks, which occur in not a few children, have a pronounced, deterrent effect on growth.

THE GASTROINTESTINAL TRACT.

I have found it necessary in eighty-three cases of tardy malnutrition to make x ray studies of the gastrointestinal tract. In children with a persistently poor appetite, those who have to be coaxed or forced to eat, we have found the explanation in a pylorospasm, in dilated stomachs, and in ptosed stomachs. We frequently find food residue in the abnormal stomach from six to ten hours after a bismuth meal. A child will not be hungry with food residue in the stomach. In addition to defective food, they are time losers in that they are those who have frequent attacks of recurrent illness in the nature of vomiting and fever.

An explanation of persistent malnutrition in children is sometimes found in the digestive tract. Thus we find the dilated cecum; the ptosed or dilated colon; angulations, and, frequently, enlarged sigmoids. The elongated sigmoid is one of the most frequent causes of obstinate constipation, low degrees of toxemia, and, not infrequently, recurrent vomiting. For the reason that when there is a delay in the intestine there is often a corresponding delay in the emptying time of the stomach. I will not undertake the care of a case of habitual malnutrition in a runabout child without an x ray of the gastrointestinal tract. Children with grave mechanical defects in the gastrointestinal tract are

never fully nourished, even though they may not be made acutely ill; neither will they be as bright and alert mentally as those with a normal digestive equipment.

The twenty lantern slides that were shown represented in each instance a case of malnutrition. The youngest patient was two years of age. They were all under weight from five to fifteen pounds; the majority under height as well. Each case had been referred to me because of defective growth and development. The personal history of all showed persistent gastrointestinal derangement. In some there was simply loss of appetite; in others recurrent vomiting; in others recurrent vomiting with fever, usually very high. In others there was obstinate constipation. Each case showed gastrointestinal symptoms of sufficient severity to call for an x ray study. In each case it was apparent that there was sufficient abnormalities to account for the persistent digestive derangement.

The lantern slides shown demonstrated dilated stomach, ptosed stomach, pylorospasm, gastropnoia, dilated cecum, ptosed colon, massive dilatation of the colon, angulated sigmoid, dilated sigmoid, and elongated sigmoid.

132 WEST EIGHTY-FIRST STREET.

THE MENTAL HEALTH OF THE CHILD.

Some Physical Determinants and a Method of Observation.

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In connection with my pediatric work at the Orthopedic Hospital School of Los Angeles, the interdependence of the mental and physical has loomed so large that it has seemed worth while to emphasize this relation as a factor in the mental health of the child. Obviously the general consideration of *mens sana in sano corpore* needs no stressing. In a vague way we are all conscious of that relation. It is to impress the direct causative factor abnormal physical conditions may have specifically upon the child's mental hygiene that the subject is discussed from the physical angle.

The great difference in the treatment of crippled children, who exhibit biased mentality, and the child of normal mentality, with inclinations toward physical defect, is that of conservation. In the chronic cripples marvelous reconstructive work is done, but at best it is reparative. In the mentally normal, the future possibilities are so much greater that eventually we shall have preventive and corrective clinics for the child of preschool age, as we now have medical and surgical clinics for the afflicted. One such clinic under the management of the Federation of the Parent Teachers' Association in Los Angeles has made a modest beginning. Its purpose has been to give the supposedly well child of preschool age, from two to six years, an opportunity to become a superior child. Instead of attempting to restore to possibly normal the ill or defective child, we start with the apparently

normal and endeavor to give him endurance and robustness which are requisite for superior attainment. Incidentally, we find that over three quarters of the children examined reveal varying abnormalities of more or less consequence. Naturally these defects are corrected where possible; so the clinic proves corrective as well as educative.

The importance of our endeavor, however, lies in the attempt that is being made to better the average—to surpass the "fairly well" standard of the present, and to inspire parents and children toward being (and doing) better. The returns noted in this clinic already have vindicated its existence, and furthermore the conviction that correction of chronic physical defects liberates mental force, has caused to materialize the Orthopedic Hospital School in Los Angeles for the explicit purpose of training these resultant mental abilities with treatment; often tedious, which the child's crippled condition demands.

A health status chart (1) in use at the clinic has been adopted as the method of presenting the physical findings to the parents, thus proving its practical adaptation. Children who, upon superficial examination, impress one as being sound physically, are not uncommonly found to reveal a health status from sixty to seventy-five per cent. normal when charted upon the basis of values. These estimated values are arbitrary and may be modified to meet the requirements of individual examiners or special conditions. The one requisite is that of visualizing health or body defects, that progress in condition may be estimated.

So largely is preventive work in children a question of parental education, and so impossible of enforcement are personal health measures, that mental hygiene, to be applied, must have a practical elemental basis easily comprehended by the parents. For this reason, approaching the subject through the medium of the physical defects and disorders, concerning which the parent has an intimate knowledge, one finds a welcome avenue to a fertile field. It matters little whether the parent completely comprehends the reflex processes by which results are obtained upon mind and character through these physical determinants. The vital fact is that this intimate association exists, and that the intangible can be reached through the tangible. Thus the parent comes to realize that improvement upon temperament and ability may be accomplished, specifically through these physical health measures. For instance, tonsils have long been enucleated for the relief of septic absorption, and because of their deleterious effect upon the blood stream and general metabolism—little argument is needed on that score—but that tonsils should be removed to prevent cardiac involvement is a step farther and is usually accomplished because of the parents' confidence in the physician rather than from being convinced of any real danger. The third step in the argument for the removal of pathological conditions, or for the correction of defects, viz., that the child's mental development shall show definite response to such treatment, requires for a convincing presentation not only the enthusiasm of the believer but knowledge of actual experience.

A practical method of physical examination whereby comparisons of conditions may be appreciated at a glance, is thus a necessary corollary, for parents readily bridge the gap between the physical status and its possible effects upon mind and disposition, provided they can be convinced that the child's condition is subnormal. Here graphic charts serve an essential purpose since the physician is thus enabled to translate his findings to the visible scale which represents the condition with reasonable accuracy.

Heredity.—Perhaps upon no other claim has there been laid greater burden of proof than that of heredity. Parents too often are satisfied to let Jimmie be thin because his father is; to permit Mary to refuse vegetables because mother does; to tolerate an irritable nervous child because he is "high strung," etc., while the possible inheritance of value from the parent, the character impressed by daily example, are given little thought. It is so much easier to fall back upon the hackneyed excuse, "He inherits that from his father."

If, as a parent one delves into the study of inherited traits, one finds that acquired characteristics are buffeted about, confused in experimental proof with mutilations, the influence of throwbacks (or primitive reversions), often ignored in the reckoning, the power of environment underestimated until one is in a quandary at each last analysis and uncertain as to what constitutes a working basis. Undoubtedly we reflect our own uncertain attitude when we fail to urge upon the child the acquirement of a taste for all wholesome foods and healthful games. In nourishment for the growing body as well as knowledge for the growing mind, "such stuff as dreams are made of" will not furnish a healthy basis for future expansion. Homely, simple food for body and mind must form the foundation of any stability in health or character. Yet so much in our likes and dislikes is explained upon the basis of heredity that unconsciously we allow our children to form pernicious tastes in the choice of food and in the formation of habits. Instead of the child inheriting a dislike, he acquires a fixed antipathy through the daily imitation of a parent lacking control, and wholly unaware of thus influencing the tastes and, through them, the growth of the child. Often these food impressions are left to the haphazard choice of a nursemaid abetted by the whims of a difficult to please child. It is bad enough to have our children acquire their accent from nursemaids, whose nasal or strident tones leave an indelible stamp upon the speech of their charges, that is unfortunate and a handicap.

The maturing mind in after years seeks to cast off these acquired peculiarities (alas, often unsuccessfully!), but food dislikes and idiosyncrasies in eating are even more vital and may be the direct and only cause of nutritional disturbances resulting in rickets, flat foot, bony deformities, and other developmental defects. Here the psychology of the mother, assuming that she has the intimate charge of the child, affects its physiology and growth; this in turn gives an undeniable twist to the outlook on life of the child and may figure in the distorted philosophy which the resulting adult

so easily acquires. The kingdom that was lost "all for the want of a horseshoe nail" does not compare with the myriads who never glimpse their kingdom because of reasons seemingly as insignificant. An old established and influential religious order is credited with the dogma that, given a religious training until seven years old, the child will never depart therefrom. In no other instance apparently do we find a well recognized and accepted working hypothesis that takes into account this preschool period as a possible determiner of the child's future. It is a period, nevertheless, in which imitation of conduct, temperament, and habits hold supreme sway. Reason and decision not yet formed, imitation and imagination are dominant. The influence that health has upon mentality and habit upon health is not appreciated. If it were, the preschool child in the family of ideals would not be permitted to drift into a haphazard physical condition as he is today. He would receive at least as much routine attention as does the family automobile, toward keeping his combustion perfect and his "machinery" in order.

In other ways than by diet, however, can the child's mental growth be encouraged. Right physical hygiene fosters healthy mental hygiene. The influence of carriage upon conduct, of posture upon principle, is too well known to need more than passing mention. "Poor bodily mechanics," quoted by Fritz Talbot and Lloyd T. Brown, of Boston, are responsible in great measure for at least three abnormal physical conditions. These in turn act as nerve irritants and affect the mental horizon. Concrete illustrations of physical determinants upon mental health are found in the commoner health problems. Among those producing direct effect upon the adolescent outlook, consider first a simple surgical procedure that is best performed during infancy or childhood, e. g., circumcision in the male. This should be universal, not alone as a protection against irritation and possible later infection, but in the nervous child a scientific operation is an effective means of aiding his mental equilibrium. Habitual apprehension of the future, as well as timidity and senseless fears exhibited in the child's daily life, is not infrequently the result of physical reflexes. Eyestrain, phimosis, anemia, and intestinal toxemia are common contributors. Freeing the clitoris in the female often allays irritation and should also be a routine procedure in infancy. Bernard Shaw's satire on specific surgery makes one hesitant to assert that tonsillectomy in the child from three to six years as a practically routine procedure would save countless lives from sporadic and epidemic infections. However, when one conscientiously observes the multitude of adults who, after dragging through half their lives, are finally rejuvenated by parting with a cryptic tonsil, or hidden source of sepsis, he finds it hard to defend any tonsil under the least suspicion. Furthermore, the death rate from heart disease receives its greatest impetus from infected tonsils of preadolescent years. Kerley has data revealing the ages from five to twelve to be the period of greatest susceptibility. This is a consideration against the doubtful tonsil upon which not enough emphasis is given. As

physicians assuming the care of children, we have been caught napping because we have no habitual method of checking up the supposedly well child. Our observations are usually made after the heart damage is done. Adenoid and tonsillar hypertrophy or infection are so commonly noted among school children as a cause of retarded mentality that they need to be merely mentioned as obvious physical determinants in the child's mental health.

Physical defects.—Perhaps the commonest and least considered physical cause for defect in character development is found in the ubiquitous flat foot or broken down arches of the foot. Analyze for a moment the component elements of character and we find application, or stick-to-itiveness a *sine qua non* in all well balanced minds. This is a quality implying the ability for persistent effort. Let the child find that standing tires him, that long tramps over the hills leave him exhausted and without appetite, that tennis makes his back ache, that skating causes his feet to pain, and we soon find that child losing interest in these physical efforts, yet by such physical efforts demanding skill, strength and endurance, are bodies made symmetrical and minds trained to coordinate. In a word, it is true that the boy who doesn't enjoy outdoor contests loses the greatest possible stimulant to clean character building. He is handicapped by this loss of mental training in the perception, comprehension, courage, and coordination which contests give. Weak arches are directly responsible for many mollycoddles in boys and girls.

The condition of constitutional asthenia to which Lewis has applied the term effort syndrome, and which Kerley pertinently says permits of "poor student material, fifty per cent. of which should be scrapped and put to productive occupation," is not always found in mental weaklings. Physical handicaps may be their mental retardants, and in many cases these are conditions which are prevented or effectively counteracted only during the early formative years. Again, while Nature starts us forth physically equipped with heads asymmetrical, legs unequal, ears imperfect, and eyes astigmatic, not all such stigmata have an appreciable effect upon character. In fact, every normal man, like every healthy dog, has several "fleas" of degeneration to keep him humble and to make him hustle. But too many fleas, like too much degeneration in the child, makes training difficult. However, one common anatomical fault leaves its mental mark because of the intimate association that necessarily lies between breathing and effort. Without argument we all agree that courage and control are desirable qualities to cultivate in the budding mind, yet the boy with ineffectively approximating jaws, with teeth failing to function because of malocclusion, is barred by reason of this defect from a fair chance in the game of life. His utmost physical efforts are made unnecessarily difficult. Observe him whose teeth do not effectively approximate and you will find that he does not excel in feats which demand the clenched jaw of determination "to do or die." However, malocclusion receives attention only because of its influence upon mastication or for cosmetic effect. It deserves a more serious con-

sideration, for an "Andy Gump" type of facial contour is not to be chosen as winner in any endurance contest, physical or mental, while a man with the viselike jaws of Roosevelt carries no handicap during the formative years of childhood as he clicks them together in friendly rivalry or determined effort to overcome. Children with the undeveloped lower jaw have been needlessly handicapped by adenoids or dental malocclusion, and their mental training is made easier if these physical deformities are corrected.

Opportunity for giving a national uplift to the health of the future is apparently at hand. Statistics of the draft examinations in the United States, revealing the now well known rejection for physical defect of every third young man under thirty-one years of age, have proved most unexpected food for thought. Permit the briefest possible reference. Our athletes have beaten the world, mortality and morbidity rates have shown amazing decreases in diphtheria and typhoid, resources have seemed exhaustless, until we have taken it for granted that to be "a young American" was equivalent to winning the threescore and ten lease on life. Cold statistics convince us there is on the contrary a lien on the lease, which will either seriously embarrass the life activities, or stop them altogether, in a million men supposedly of the nation's strength. How does this directly relate to the child's mental hygiene? Physical handicaps are to be prevented only by educational influences wisely and constructively utilized among our children. The five groups of defects or diseases, constituting over three fourths of the million rejected, fall within the limits of diseases preventable, or possibly correctable, if seen early. These same conditions are incurable if advanced. It is to the effect upon the reconstructed lives which children so afflicted must form, to the influence these abnormalities have upon mentality, that present emphasis is laid.

Heart disease heads the list. It is often incurable, and so ranks first as a physical determinant on future efficiency. To treat this as a physical problem merely, without a consideration of the mental warp and fear psychoses the confirmed cardiac exhibits, is to beg the question. The prevention of heart disease is emphatically a physical problem of childhood, but the burden of its weight is distributed throughout the years that remain, be they few or many; and the physical limitations of chronic cardiac patients are the least of their burdens, as everyone familiar with the fear psychoses of these unfortunates will attest.

Tuberculosis, with its roster claiming distinguished and brilliant minds the world over, shows its prevalence in the war data, where every tenth man, or over 100,000 of the flower of our youth, was afflicted with the disease in active process. The point in preventive work is that infection begins in childhood, that it has already decimated the health ranks of our young men, and even though the mental impress may be exhilarating and stimulating instead of depressing and fear inspiring, as in chronic heart disease, both diseases are factors in the mental outlook and the preschool age should be the time for their consideration and prevention.

Nutritional disorders *per se*, with their sequelæ of bony distortions and developmental defects, claimed another third of our rejected young men. A third of a million youths, whose fundamental nutrition was defective, proves we have much to teach (perhaps to learn) about elemental body requirements and food balance. These deficiencies in nutrition are from ignorance, not poverty, and Hindehede's observations upon the blockade in Denmark, during which the mortality decreased thirty-four per cent., are revolutionary. He says: "It would seem, then, that the principal cause of death lies in food and drink. The people must first have bread, potatoes, and cabbage, in sufficient quantity, and then some milk." He further says: "If central Europe had adopted this plan there would have been no starvation or malnutrition." Chapin (2) points the way to the pediatricist's possible influence upon the national welfare. Children with chronic indigestion or constipation or with faulty bodily hygiene are not the ones who radiate happiness. It is, furthermore, impossible for a child to have a happy outlook upon life, who doesn't habitually feel well, and the habit of being well carries with it the possible habit effects upon mental and moral qualities. It is not at all uncommon for the pediatricist to encounter children of six or seven years who complain of "the hardness of life," whose brows are already wrinkled in habitual brooding, and whose mental attitude is habitually apprehensive. These children are not defectives nor are they normal children suffering from the occasional upset which is part of childhood, but are already "chronics" and as surely growing up into social agitators and fault finders, disgruntled with themselves and their associates, as are the borderline cases and degenerates, productive of morons and criminals. The latter classes are congenital and a problem set apart, but the embryo pessimist is not one decreed by fate, nor does he become that from choice but rather because of a wrong habit hygiene, moulding his psychology, his habitual attitude toward the world.

It is unnecessary to note further correlations. Progress in glandular therapy is daily making therapeutic history. It is not inconceivable that blood analysis eventually will enable us to estimate what hormone is out of balance. Undoubtedly in certain groups great strides have been made, and in glandular dyscrasia a physiological basis is commonly found for the mental aberrations. Indeed, so great is this factor in the correlation of the child mind and body function that I hope to present some of these practical applications at a later date. If in this present discussion there is suggested a means whereby the supposedly well child may be "dry docked" every three or six months during the pre-school period from two to seven years and freed from the barnacles that retard his mental progress, ultimate good will come in far greater measure than mere physical findings at first glance would indicate.

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- 1109 BROCKMAN BUILDING.

LUMBAR PUNCTURE IN DISEASES OF CHILDREN.*

Its Indications and Technic.

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Lumbar puncture was first employed by Quinke, in 1890, for the relief of intracranial pressure symptoms in cases of tuberculous meningitis. Furbringer followed in 1895 and employed this means for diagnostic purposes (1).

As an aid in making a diagnosis, lumbar puncture is recognized by clinicians the world over. Every obscure case deserves it; some cases cannot be correctly diagnosed otherwise, while others cannot be successfully treated without it. Its diagnostic value is the more important one; as one author states, "The diagnostic value of lumbar puncture far exceeds any therapeutic value yet described." While most conditions having their pathological basis in the cerebrospinal nervous system can fairly well be diagnosed by clinical observations alone, it remains for the lumbar puncture to corroborate or disprove such a diagnosis. It is not at all rare that the symptom complex of a given case closely fit the diagnosis, we will say, of purulent meningitis, but after a lumbar puncture has been done and the spinal fluid examined the verdict is changed to that of poliomyelitis, or vice versa. While no one today questions the value or practicability of a blood count or urine examination, there still remain a goodly number of practising physicians who deny their little patients the benefit which may be derived from an early lumbar puncture, carefully performed.

Dr. Neal (2), of the laboratory of the Department of Health, of the City of New York, says: "Spinal puncture and the examination of the contents are our most reliable aid in the recognition of poliomyelitis." La Fetra (3) wrote as follows: "Lumbar puncture may show bloody fluid where intracranial hemorrhage is diagnosed." Holt (4) in his book states that lumbar puncture "is the most important means of diagnosis we possess," and further says "I believe it to be absolutely free from danger if properly performed." Koplik (5) may be quoted as follows: "Lumbar puncture is devoid of danger and should be performed without delay in all cases in which we have reason to suspect meningitis. The aim should be to puncture early, for delay means spread of the inflammation and the rapid advance of the disease." Heiman (6) says: "The procedure itself is harmless and is of the greatest diagnostic value."

I believe that quoting the conclusions gained from experience by these clinicians will help convince those who are still skeptical, as to both the value and the safety of this procedure. There is another group of men who are fairly well convinced of the value of lumbar puncture, but who constantly harbor fears of infecting the spinal canal and its meninges in making a lumbar puncture.

*Read before the East New York Medical Society, May 20, 1920.

It is not at all rare for one to hear that a lumbar puncture might have been resorted to, but the fear of a fatality as a result was held out. In fact, the case which suggested to me the topic of this paper as being timely for discussion was that of a newborn baby seen by me with Dr. A. Koplowitz, where we made the diagnosis of intracranial hemorrhage and a lumbar puncture was quite naturally suggested. The parents readily consented, but a relative of the family from New England, who unfortunately happened to be a physician, strenuously objected to the procedure as being a dangerous operation, and no reasoning could convert him to the contrary. That patient died, in accordance with the prognosis, within twenty-four hours, having been denied the probable benefit of a lumbar puncture with the consequent relief of pressure. Having established the exactness of the diagnosis by the presence of bloody fluid, an immediate operation might have saved that child's life. Even though the number of patients who recover are few, the fear of infection should not deter anyone from doing a lumbar puncture, for the same reason that no surgeon would hesitate to do a laparotomy for fear that he may infect the peritoneum. Michael, of Chicago (7), states: "The meninges are very difficult to infect by lumbar puncture." It is understood that the most stringent rules of asepsis should be observed in the preparation as well as throughout the course of the operation. Of all the numerous lumbar punctures which I have done, both in the wards, in the outpatient clinic, as well as in my private practice, not one case resulted in infection.

Pfaundler (8) reported two hundred cases of lumbar puncture without a single bad result, except in one case, where there was collapse due to the removal of too much fluid. Northrup (8) reported no ill effects in fifty cases. Gumprecht (8), in 1900, collected fifteen cases of sudden death and added two cases of his own, following lumbar puncture, but in not one of these cases could it be proved with satisfaction that death was due to the lumbar puncture itself. McDonald (9) reports no bad results except in one case where the patient suffered from headache and syncope, following the removal of fluid. Here also it is possible an excessive amount of fluid was removed. Weinlander (10) reports a fatal outcome in a boy of twelve, but his patient suffered from acute nephritis and uremia at the time of puncture, a sufficient cause for the end result even without his having done a lumbar puncture.

During the last epidemic of poliomyelitis, a thousand punctures (4) were performed at the Kingston Avenue Hospital with no ill effects in any case. It is perhaps timely to repeat the admonition made by many observers never to perform a lumbar puncture when the patient is moribund, if one fears the possible blame to be laid to the lumbar puncture, instead of to the disease which indicated the puncture. What are some of the indications of a lumbar puncture in a child? The indications might for practical purposes be divided into three general groups:

1. For the relief of pressure symptoms.

2. For the purpose of differential diagnosis.

3. For the purpose of administering therapeutic aid intraspinally.

Under the first group come a large number of conditions, both in infancy and childhood.

A. It is a well recognized fact that some cases of hydrocephalus are greatly improved by repeated lumbar punctures, according to Quincke (12). This is true both of the congenital type as well as of the one secondary to meningitis. This statement will bear modification, namely, that experience has taught us that a goodly number of cases of hydrocephalus only refill much more rapidly after they have been tapped once or twice. I recall one case which refilled within a week after the first puncture when the head assumed such large proportions that the patient could not be recognized on the next visit to the clinic. On the other hand, I recall two other cases where the head circumference measured about twenty-three inches on the first visit and by the help of weekly punctures, both spinal and also of the lateral ventricles according to Kausch (13), I succeeded in arresting the abnormal growth of their heads and they are now able to walk around and are happy.

B. In types of meningitis due to some type of organism against which we have no specific antidote, the simple drawing off of the fluid accomplishes drainage as well as relieves pressure symptoms, temporarily perhaps, as in tuberculous meningitis. Convulsions may subside and the patient may get a temporary rest. In fact, there are on record some fourteen cases of tuberculous meningitis reported cured by repeated lumbar puncture, and while we question the authenticity of the diagnosis, we must still bear in mind that it happened in the realm of medicine; hence why doubt it?

C. In acute infectious diseases, pneumonia for example, complicated with serous meningitis or so-called meningismus, the headache, convulsions and opisthotonus are relieved almost immediately after puncture is done.

Considering the second group, every time one is called upon to make a differential diagnosis between an acute disease complicated with meningismus and purulent meningitis, or when one is confronted with the problem, is it a case of tuberculous meningitis or of poliomyelitis; or a given case may present some symptoms of cerebral lues and colloidal gold and Wassermann tests on the spinal fluid have to be done, then our mind immediately reverts to the name Quincke. We send the patient's spinal fluid to the laboratory for a cell count and for the determination of the predominating type of cells and type of organism. A lumbar puncture not only helps us in suggesting the proper management of the case, but it also directs us with regard to the prognosis, from the viewpoint of the family, which must be taken into consideration.

What may be learned from a careful examination of the spinal fluid may be answered by briefly quoting Dunn, as quoted by Rachford, who sums up the diagnostic importance of a carefully examined cerebrospinal fluid specimen in the following manner: "If the fluid is cloudy, some form of meningitis is present. If the fluid is clear, no form of

meningitis can be present except tuberculous." If the cell count is normal (under ten to the c.mm.), no meningitis is present. If the cell count is over ten to the c.mm., some form of meningitis is present. In tuberculous meningitis, the mononuclear leucocytes predominate and the fluid is clear. If the predominating cell is of the polynuclear type, that points to a suppurative form of meningitis. In poliomyelitis or encephalitis the fluid is clear, no bacteria are found, and there is a preponderance of large mononuclear cells. In meningismus, while the fluid is increased in quantity it is normal in character." (2).

As for the third group of indications, one need only refer to the difference in the mortality rate of cerebrospinal meningitis previous to 1890, and the present time to convince the most sceptical as to its benefits as a therapeutic measure.

With the advance in therapeutics the administration of the Flexner's antimeningococcic serum is only one type of intraspinal treatment, and already there are other remedies for different diseases being utilized, for example, in severe cases of cerebrospinal lues, neosalvarsan is used intraspinally with marked success. In 1916, Goodman (15), of the Jacobi clinic, introduced the autoserum treatment for cases of chorea, and while the results are not uniform at the hands of all observers, it nevertheless merits a trial, especially in the cerebral type of chorea. Gemma (12), in 1914, two years before Goodman, advised lumbar puncture for severe cases of chorea, also for whooping cough, etc.

Perhaps the most important part of this paper should be the paragraph dealing with the technic of the subject in question. The procedure need never be limited to the environs of an operating room of a modern hospital. In fact, any fairly clean home is well fitted for the carrying out of lumbar puncture. The kitchen table forms a desirable operating table and the fear of infection is a good prophylactic measure for one to carry in his mind and, therefore, take every aseptic precaution to avoid such an accident.

Necessary articles.—A clean sheet for the table and another to cover the child's body, a few sterile towels, a sterile gown, rubber, several sterile test tubes, and a pus basin, all of which are indispensable.

Instruments employed.—One twenty c. c. Luer syringe, and two needles. (The usual Quincke needle is found to be too large and is not recommended for children. Strauss has devised a needle for lumbar puncture (20), but is rarely used for children.) The operator should always examine these instruments himself. A glass funnel and proper tubing attachment to fit the needles should be provided, all sterile and in working order. This preparation can be carried out in any private residence within short notice. Occasionally members of the family must take the place of nurse and assistant.

The position of the patient.—Much has been written by various authors on this question. Campbell and Kerr (16) advise against the sitting posture, because of the danger of breaking the needle. Fischer (17) in his textbook recommends the right or left side. Norman Williamson (18)

describes a special chair for lumbar puncture, but this chair calls for cooperation on the part of the patient, hence its impracticability in children. This question may be settled by compromising and recommending both the sitting and the recumbent posture. At times it serves the interests of the patient to combine the two postures at a single puncture. As a result of eight years of experience the sitting posture can be recommended for the inexperienced and the recumbent posture for the man who is well trained. Any discussion as to which side is preferable, right or left, when employing the recumbent posture, only occupies unnecessary time and is of no importance from the practical point of view. One has to be a well trained acrobat to do a lumbar puncture with the patient on his left side, unless the operator is left handed. The body should be well flexed, regardless of the posture employed. The parts having been made aseptic with tincture of iodine and alcohol, one chooses the third or fourth lumbar interspace; a line drawn between the crests of the ilia across the back, where the line intersects the spine at the level of the fourth lumbar vertebra; you can therefore choose the interspace above or below. The forefinger of the left hand is used as a guide. Holding the needle in the right hand, it is inserted perpendicularly to the spine, and the needle is firmly forced in the median line into the spinal canal.

The next question that usually arises is how deep the needle should be inserted. This question is answered differently by different authors. Kerley (19) recommends an inch. Other authors recommend an inch and a quarter. I feel that such advice only tends to confusion. The answer we usually give is, go ahead until you get fluid, for the depth varies greatly with the age as well as with the degree of development and the weight of the patient. In some cases you may feel, by the diminished resistance, that you entered the spinal canal. But not in older and well developed children.

Dry tap.—A good deal of criticism has been aroused against the technic which results in a dry tap. One prominent New York pediatricist, when asked what he would do if he got a dry tap, replied sharply: "Get somebody that knows how to do a lumbar puncture." And still it must be conceded that occasionally one will get a dry tap. Dunn makes the following statement: "Peculiar anatomical conditions or certain pathological conditions at the base of the brain may prevent one from reaching the lumbar portion of the spinal canal, hence a dry tap." Again, one may also get a dry tap as a result of adhesions around a point of a previous puncture (17). It is, therefore, advisable, in the treatment of a case of meningitis, where you expect to give serum injections, to begin at the lowest point possible in order to avoid such occurrence. Whenever such adhesions have taken place we must utilize the lateral ventricles. Holt (4) reports a dry tap in four out of thirty-nine cases. In a case of cerebral hemorrhage in a newborn baby admitted to the Post-Graduate Hospital, in May, 1918, on which several attempts to obtain some spinal fluid made by myself as well as by two men of the house staff, were unsuccessful. The necropsy findings by Dr.

McNeal justified the dry tap by disclosing a large blood clot extending from the brain into the spinal canal. These facts are sufficient to prove that a dry tap is not always explained by an inefficient technic.

A word concerning possible accidents in the course of or following lumbar puncture. Breaking of the needle happens occasionally, and should not frighten one. If you are careful and avoid using a long pointed needle, and if you do not bend the needle while introducing it, you may save yourself that accident. If the needle should break, unless the broken end can be easily extracted, it is best to defer its removal to a future time when the patient has recovered from the acute stage of his illness, and even then you may decide to leave it alone.

Koplik (21) reports two cases of apnea from shock more alarming than a broken needle, but he does not tell us the state of health of the patients at the time of the puncture. In such an occurrence one should stop the operation immediately, lower the patient's head, resort to artificial respiration, administer adrenaline, and apply external heat to the body.

In cases of chronic hydrocephalus, where one expects to remove large quantities of fluid, the patient should always be kept on his side during puncture, in order to avoid undue shock. The wound should always be properly dressed, with cotton and collodion, or with adhesive plaster. It is not advisable to use collodion when repeated punctures are planned. Occasionally a bloody fluid complicates the procedure. By using a short pointed needle this may be avoided. This is not a dangerous accident, but a bloody specimen is useless for the purpose of examination. Occasionally only the first few drops are bloody, when a fresh test tube will collect a desirable specimen.

CONCLUSIONS.

The operation is simple, with practically no danger to the patient. Its usefulness for diagnostic purposes is indispensable, and should be done early in the course of the illness. The technic should be learned by all physicians.

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327 PENNSYLVANIA AVENUE.

MIDDLE EAR DISEASE IN CHILDREN.

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Of all conditions that prove an enigma to the average general practitioner, none can quite equal the case of a young child with an unexplained hyperpyrexia. Being fairly well satisfied that the respiratory tract is clear, and if, after the routine laboratory aids, the physician comes to the conclusion that a pyelitis does not serve to explain the temperature, his case becomes infinitely more complicated. After a day or two of observation, without the appearance of those manifestations which point to a possible exanthem, he often finds himself confronted with that familiar interrogation: "Well, doctor, what do you think is the trouble with my child?" We do not think we are taking too much for granted when we say that at this stage of the game the attending physician is at a loss to explain the child's condition, and if he is possessed of a conscience, would almost wish that, through some good fortune, Providence might rid him of the case. Unfortunately, many men find themselves in a predicament similar to the one we have just depicted, and we are certain, if one will take the trouble to recall those cases which have baffled him most in his practice, a large percentage of them will find a place in this category.

It is unquestionably true that, from the viewpoint of holding his patient, the practitioner finds it a most difficult task to perform. Although knowing that he has failed to account for the child's condition, he will persist in procrastination and defer that assistance which, in addition to solving the problem for him, would afford him an unusual opportunity to crown himself with glory and establish himself most firmly with many a family, and also bring to his weary and much concerned mind a feeling of peace and satisfaction.

It is only upon the appearance of an aural discharge—and this most often discovered by the mother—supplemented by the usual history that the child slept soundly last night for the first time in seventy-two hours or more, that the unsuspecting physician's attention is first directed to the existing and undoubtedly causative aural condition. There is no question in our minds—and many men will bear out our statement, that of all conditions met with in children, middle ear affections rank first among those most frequently overlooked. Very often the early detection of an otitis, although not yet fully established, will frequently lead to a satisfactory explanation of these temperatures and will, in addition, insure early operative intervention, should such measures become necessary. Furthermore, it will assure the patient that the attending physician is alert and on the job and the physician

himself will not overlook a condition for which, in the majority of cases, one can hardly find a just vindication.

We are indeed well aware of the many difficulties with which the general physician is confronted, and especially those obstacles with which he must contend when attempting to induce his patient to consent to a consultation with the aurist, and we are certain no one can appreciate this more than we do. It is with this understanding that we feel most keenly for the general practitioner, and although we may appear somewhat censorious in our statements, we assure you there is not the slightest intention on our part to reproach him. He has far too many cares and worries, and with this in mind, the specialist must not be unreasonably severe in his criticism. But we do feel we are not overstepping bounds, no matter how emphatic and exacting we may seem, when our efforts and endeavors are directed toward awakening in the mind of the general practitioner a sense of the colossal importance of ear examinations in children. Too much stress cannot be laid upon this subject, and the general practitioner must constantly bear in mind that a physical examination in a child is never complete without paying adequate time and attention to the ears.

The external auditory canals in infants are narrow and, in younger children, it is often no easy matter to obtain a good view of the drumhead, but we believe that in many of the cases we have seen there was no reason whatsoever for error, or apparent neglect to examine the ears. We will grant you that the general practitioner is not to determine whether the child is suffering from a catarrhal or a suppurative form of otitis media, or whether there is bulging here or retraction there; but we do feel that he should at least suspect the ear condition when his patient presents an unexplained temperature, and when in doubt he should seek advice so that his suspicions may be either confirmed or dispelled.

We have here in mind a case we saw only recently in which both the attending physician and the consulting pediatricist failed to recognize the aural condition. For twelve days the child had a temperature ranging from 101° to 104° F. Although not established by the laboratory, the consulting pediatricist made a diagnosis of pyelitis, "as a result of exclusion," he termed it, having taken into consideration the child's age and the fact that he failed to find any other cause to which to attribute the temperature. When we saw the child, we found a subperiosteal abscess had already formed. It should be remembered that the pediatricist had seen the child only forty-eight hours previously, and apparently neglected to examine the ears, or failed to recognize the existing ear condition.

We sometimes fail to understand why general practitioners will permit cases similar to the one we have cited, to go on for days without seeking advice, and even when the diagnosis of purulent otitis has been established by the presence of a discharge, will permit these cases to go unseen for weeks, with more or less indifference, giving little thought to the dangerous sequelæ that might follow. The at-

tending physician is then suddenly overwhelmed when his attention is called to swelling and edema over the mastoid, obliteration of the postauricular fold, and an auricle standing away from the child's head. It is only upon the recognition of these dangerous complications that the practitioner is aroused from his lethargy to seek aid. The presence of a subperiosteal abscess is very often the only pathognomonic sign of mastoid disease known to some practitioners, and we have had occasion to come in contact with men who believed this was the only indication for operative intervention in children. Whether, in view of our modern knowledge of handling these conditions, this belief should still be prevalent, we leave it to your own judgment. True, many cases of middle ear disease clear up without operation and, as a matter of fact, most of them have such a happy termination; but if, after a reasonable length of time, one fails to clear up, investigation should not be delayed too long in ascertaining the cause.

If discharging ears are associated with evening rises in temperature, namely, 101° to 103° F., whether this temperature is the result of the otitis must be decided. In other words, if an ear has been discharging for one or two weeks, associated with evening elevations of temperature, our examination must determine whether there is evidence of insufficient drainage facilities, as indicated by the size and location of the perforation or incision. If there is a good sized opening, without a bulging drum, with little or no sagging of the posterior superior canal wall, in the absence of a profuse discharge, we can rest assured that the cause for the temperature should be sought for elsewhere. If, on the other hand, we note a nipple shaped projection, at the apex of which we find a pinpoint perforation, through which a drop of pus can be seen exuding—which picture is good evidence of insufficient drainage—we may justly attribute all or at least part of the temperature to pus retention. There is essentially no difference in pus retention here from that in any other part of the body.

Sagging of the posterior superior canal wall is of great importance when taken together with all the other signs and symptoms. In itself, in early cases and in very young children, as far as being an operative indication, its value, we believe, has been overestimated. We have seen cases in which there was sagging with a vengeance, so to speak, which cleared up most rapidly and completely, and on the other hand, we have seen cases which exhibited very little sagging and upon operation disclosed extensive erosion of the sinus and dural plates and even destruction of these structures, with exposure and disease of sinus and dura.

The amount of discharge itself is often a most important operative indication. A so-called waterfall discharge, one which reappears abundantly immediately upon wiping away, even if unattended by marked rises in temperature, and, if of any duration, is strong evidence that the infection is not limited to the middle ear spaces, but the attic and antrum and possibly more important structures are also involved. The diseased mucous membrane in the middle ear when alone involved cannot pro-

duce so profuse a discharge. Hence it is gross neglect to permit these children to go on for weeks and months with profusely discharging ears. It is only later in life that the bad effects of this neglect are made apparent. At this time is laid the foundation for cholesteatoma cases, for semicircular canal fistulæ, and for labyrinthine and intracranial complications, not mentioning the concomitant impairment of hearing which follows, even if these patients escape the more serious complications.

In passing, it is well to mention that the middle ear conditions occurring with little or no elevation of temperature and few constitutional symptoms, such as are seen in undernourished, debilitated and marantic children, and those seen in the tuberculous, are not included in this category. These children very often present serious effusions and even purulent secretions in the middle ear, with practically no constitutional reaction that might serve to call our attention to the existing otitis. During the routine examination of these children the ear condition is accidentally discovered. We make mention here only of aural affections occurring in the young and healthy infant.

It is, therefore, the duty of every general practitioner to whom is entrusted the care of children, especially those in the early years of life, never to fail to examine the ears. This is particularly true in children suffering from measles, diphtheria or scarlatina. Ear complications are most prone to develop in these children, and the usual symptoms which direct our attention to the ears are often absent or masked by the symptoms of the initial disease. We cannot impress upon you too strongly the rapid and extensive destruction that takes place, especially in the last mentioned disease. It is of the greatest importance to bear this fact in mind. One examination of the ears in such cases is entirely inadequate, but an examination conducted at regular intervals during the course of the disease is of paramount importance.

If the attending physician has not had sufficient experience in examining ears, so that he may arrive at a satisfactory conclusion, he should not hesitate, in justice to the patient and to himself, to seek advice, especially in those cases in which he cannot satisfy himself as to the cause of an abnormal temperature. If the patient comes to him with a running ear, he should not be content with merely prescribing an irrigation, but should be sufficiently interested to ascertain the exact state of affairs behind the discharge. Above all, he should not be guilty of sitting aside, idly waiting for the more serious complications to stir him.

We feel assured that if the proper precautions are taken in determining these cases at the outset; if the general practitioner will exhibit the interest becoming such conditions; if he will always bear in mind the great frequency of aural affections in infants and will endeavor to bring them under the care of the otologist, who can do most for these cases in the early stages of the disease, he will be going a long way toward averting and offsetting those serious complications which the aurist is so often called to treat.

691 LAFAYETTE AVENUE.

THE WEAK FOOT IN THE CHILD.

Flexible Flat Foot.

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(Concluded from page 993.)

It is peculiarly unfortunate that persistent pain in the young children is often lacking. I say unfortunate, because if direct pain were more marked, parents would, of course, give the condition early attention. Where pain is present, the tendency is to regard it as growing pains. The absence of persistent pain is easily explained. Pain itself can only occur with or be consequent to such factors as overstrain, actual injury, or in disease as, for example, a tuberculous arthritis of the ankle or neighboring joints. In the common weak foot, however, we have no history of direct injury or disease, while the element of overstrain cannot operate to produce persistent pain because of the relatively lighter weight of the child's body and the frequent rest periods to which the child resorts. It is only when the child gets older and heavier, or where we have an unusual rapid growth or increase of weight, or where employment necessitates foot work without a choice of rest periods, that the element of overstrain enters and painful disability and often nervous exhaustion become the dominating symptoms.

We can thus realize the intimate relationship between the weak foot and the body mechanism. It becomes clear that in attempting to correct faulty posture in any part of the body, the feet should not be overlooked as a possible direct or contributing factor in creating lack of body balance. Where the abdomen projects excessively or round shoulders exist, where there is clumsiness in action and frequent falling, we may also find that the child is suffering consciously or unconsciously from a weak foot which may require prime consideration. The general practitioner might do well, therefore, to include the feet in a routine examination of the child, particularly after acute illnesses that may have weakened the general musculature.

In the treatment of the ordinary weak feet in children the use of operative surgery is not a logical expedient because as we have seen the problem is not one of a fixed and localized deformity as much as a functional weakness on the part of several structures and restoration of functional ability on the part of the weakened structures is of prime importance, not the correction of the deformity. When functional tonicity on the part of the weakened fleshy structures has occurred, the deformity automatically disappears. Operative methods are contraindicated also, because of the danger to ultimate bone growth from interference with rapidly developing bone; but primarily because the prognosis by the use of simple measures and the co-operation of the patient, is both excellent and fairly immediate.

The use of plaster of paris or adhesive plaster dressings for the purpose of maintaining the foot in an overcorrected (inverted and adducted) posi-

tion is contraindicated here. Such measures are appropriate to overcome spasm, or fixed shortening of the peronei muscles, or where immobilization is sought, as in an acute inflammatory condition. Here, however, none of these conditions obtain while the element of continued immobilization, more so with the plaster of paris, incident to these methods contradicts the prime essential for the cure of the condition, namely, the restoration of functional ability which can only be secured by function. With adhesive plaster, we have less immobilization, but the continuance of adhesive on the skin over a period of time as required in the majority of these cases cannot long be tolerated. In some cases, however, I have found that several adhesive plaster strapings so adjusted as to throw back the heel bone, when used in conjunction with due attention to other elements of treatment, has resulted in an unusually rapid correction in a few weeks and in some rare cases in about a week. This is not typical, but where it has occurred the child seemed to be unusually intelligent, and this intelligence may have operated reflexly to, effect an instinctively enforced assumption of the correct position during the time that the adhesive plaster dressings prevented the assumption of the incorrect posture. The objection of immobilization holds also with leg braces that are intended to hold the foot in an overcorrected position.

The successful treatment of the majority of these cases demands specific attention to the following essentials: 1, Attitude; 2, footgear; 3, exercise to restore functional tonicity to the relaxed muscles and ligaments; 4, preventing the feet from assuming the attitude of deformity, but without functional interference.

Attitude.—This needs no further comment except that care should be taken that improper standing or walking is not secondary to other postural or structural causes.

Footgear.—As already stated, correct fitting should be understood and checked by the practitioner treating the patient. In the shoe itself, the fore part should adduct slightly toward the median line of the body so as to help preserve a normal relationship of the longitudinal segments of the arch. Excessive adduction, however, of the front of the shoe, may by pressure induce an irritation at the region of the fifth metatarsophalangeal joint, and thus affect gait. It is absolutely necessary to avoid impingement against the large toe—a caution which cannot be too strongly emphasized. Pressure against the large toe is the forerunner of the hallux valgus and the unsightly bunion or the two conditions combined. Primarily such pressure by abducting the large toe from the median line of the body diverts direct action of the exterior longus hallucis and the flexor longus hallucis, which muscles attach to the large toe, from the leg and are important adjuncts to the maintenance of the arch. Counter and waist should be snug. From the viewpoint of prevention in a normal foot, such factors as the softness of growing bone combined with the unyielding street pavements and the normal tendency of the os calcis to rotate inward, seem sufficient argument against sandals, sneakers, and flexible

shank shoes generally, and these, therefore, are certainly barred as therapeutic considerations. Though, perhaps, the subject in hand does not warrant an unduly prolonged discussion on the shoe question, two interesting items warrant reference. One relates to the so-called problem of making a proper shoe for the child. My observation of the children's shoes on the market show me that no problem would exist if an attempt were actually made to simply follow the contour of activity of a normal child's foot—something that has not yet been done from the viewpoint of manufacturing a standard shoe. Of course, the fitting problem for a particular case still exists. The other item of interest on the shoe question is the favorite argument resorted to by the exponents of the flexible shank shoes that nature intended perfect freedom of function for the delicate plantar structures of the foot in order to attain perfect development. But was it Nature or man who evolved city walks—hard, unyielding surfaces, and which are themselves so artificial that even the horse must be shod for protection against the jar? Besides, proof is lacking that, given a rigid shank shoe in a particular case, the shoe to be well fitted, interference with foot function actually exists.

Nor should we overlook the directly contributing influence of stockings in producing mechanical foot disorders, particularly the weak foot. It has always been a matter of surprise to me to find that in written or oral discussions on foot ailments, too little consideration has been given to the stocking. It should pass as too plain for discussion that even with proper shoes, much damage can be effected through stockings that are too short, of unyielding texture, and which, therefore, by cramping the toes, interfere with circulation and function.

But with the weak foot in particular, the stocking has an intimate relationship. This can only be appreciated by observing the peculiar changes that take place in and about the large toe when off the ground at rest and when bearing weight in activity. When weight bearing its function distinct from that of the smaller toes is that of a weight bearing base from which the body is thrust forward while at the same time the smaller toes grip the ground by a flexion or bending at their first interphalangeal joints: To bear the body weight, the great toe remains straight through its length while the gripping action of the other four toes is manifest in the flexion mentioned. But this is not all. With the foot off the ground in the rest attitude, the tendons attaching to the great toe are relaxed, permitting that toe to lean up against and come in contact with the second toe (Fig. 6), and a straight line if extended on the inner margin of the foot from heel to toe would not come in contact with the entire inner margin of the great toe. Under weight bearing, however, the large toe swings in toward the median line of the body (Fig. 7) so that a straight line extended on the inner side of the foot from heel to toe would touch the large toe along its length and a space now exists between the large toe and its neighbor. As the large toe swings toward the other foot in the upright position to take the weight of the body, it does so by the tightening of the tendons of the muscles attaching

to it, the extensor longus hallucis and particularly the flexor longus hallucis. The tautness of the flexor longus hallucis tendon, which runs across the entire sole forward to the extremity of the large toe, results also in a bracing of the segments of the longitudinal arch so that the concavity under the arch becomes visibly increased, particularly in the tip toe position at the end of the step, when, through the tightening of this tendon, the concavity of the longitudinal arch is at its greatest. The ordinary stocking is, however, median pointed as if both sides of the foot were symmetrical and terminated in a tip with its farthest extremity at the third toe instead of at the first. Thus ordinary stockings by compression maintain the large toe against the second even when the foot is bearing weight and when the large toe should adduct inward. Besides the stocking is put on with the foot off the ground, which is the position in which the large toe leans against the second. Thus there exists a combination of factors that tend to make inevitable the inefficient operation of the large toe as a weight bearing and locomotive factor, and with this, therefore, a consequent weakening of the long muscles attaching to it and to all the toes which brace up the arch. Almost invariably, therefore, in cases of hallux valgus do we find an associated weak foot or flat foot, or symptoms of arch strain. A fuller realization of the special function of the large toe and its essential shifting toward the other foot in weight bearing, may some day result in stockings with separate stalls for the large toes and shoes with straight inner lines becoming more universal items of dress. When that day arrives, a great proportion of weak and flat foot cases will simultaneously begin to disappear.

Exercises.—The anatomical pathological condition is a varying degree of relaxation of the adducting muscles and of the ligaments of the legs and feet, thus resulting in abduction and eversion. The exercises should be suited to the particular case and are such as invert the entire foot, adduct the forefoot, throw the ankle outward, besides training in normal posture and locomotion with the child barefooted. As structural shortening of muscles is rare, manipulation seems hardly necessary.

In general, exercise in the child's case can be easily effected by converting an otherwise dull proceeding into a session of play. This can be done by having the seated child rotate its feet around the fingers held at certain heights and angles, or catching and tagging a finger that is actually guiding the foot in active overcorrection.

It is perhaps unnecessary to state that in the treatment of the weak foot or any other condition, if an accompanying active destructive process is present, such as tuberculosis of bone or joint, rachitis, or an infectious arthritis, rest and the maintenance of the foot in an attitude that will prevent permanent subsequent deformity are indicated instead of exercises.

As prevention is always of prime interest, it is proper to here allude to an element of care which may prevent weak feet consequent to prolonged confinement to bed. Aside from the direct weakening effects on the tissues of the foot due to the

disease itself which has occasioned confinement, a change often occurs in the legs and feet which may affect the weak feet. This occurs because, in the attitude of rest as in bed, the foot tends to lie in extension, that is, at an angle of over ninety degrees between it and the leg. This angulation is illustrated in the rest attitude that has been assumed by the child in Fig. 6. When this attitude is maintained over a period of time as with continued confinement, structural shortening of the calf muscles takes place with a corresponding relaxation and weakening of the anterior muscles—a sort of mild, nonparalytic talipes equinus. With walking resumed after confinement, such structural shortening of posterior and relaxation of anterior muscles of the leg interferes with normal flexion and extension of the foot on the leg which is required in locomotion and may occasion a secondary flexion or lateral displacement of the midtarsal joints just as occurs in the weak foot and as more fully detailed in a previous article on the high heeled shoe (1). To prevent these structural changes in the leg muscles, it is advisable during confinement and where a local condition does not contraindicate to daily manipulate both feet in flexion, extension and circumflexion, or to have the patient engage actively in these movements if possible.

Preventing the foot from assuming the attitude of deformity without interference with function.—We have seen that, in weak foot, the heel bone enhanced by normal anatomic peculiarities and a weakened musculature falls inward, and that with this the forefoot abducts and the arch thus angulates with an inward lateral convexity. Where in the normal foot, the entire force of the body weight was directed vertically through the tibia and astragalus on to the heel bone and eventually over the longitudinal axis of the foot, it is now to a great extent diverted toward the inner margins of both feet. By bringing a sufficient pressure to bear in a reverse direction to the inclination of the heel bone, that is, both at the upper inner and lower outer surfaces of this bone, we automatically restore the normal alignment of the longitudinal arch and correct whatever secondary misalignment exists in the knee, hip and spinal articulations. Our problem then concerns itself with forcing and holding this bone in place. In the very mild cases this bone may be ultimately thrown back and the condition cured by attention to attitude, footgear, exercises, and the elevation of the inner margin of the shoe heel, a requisite height depending on the particular case. In the more advanced cases, however, this is insufficient, and experience has demonstrated the final expediency in even a majority of these cases for the unyielding and corrective pressure that only metal can give.

The necessary lateral pressure to counteract the force of the body weight concentrated at and below the ankle joint cannot be secured by stiff counter shoes, commercial supports and the like, as these cannot prevent the ankle bulging and their rigidity is lost through softening by body heat. The suggestion of metal, however, raises the natural question of how to utilize it to the best advantage without immobilization of the foot. This, in turn, calls

for a little inquiry into the commercial appliances now on the market, with particular relation to their value in treatment.

In referring to the arch support, it should be borne in mind that promiscuous application of foot plates has been justly condemned by many eminent orthopedists, unless made over a specially corrected plaster positive of the foot to secure the proper indications in a particular case, and then used as an adjunct in treatment which aims to discard them when their use is no longer necessary. This is all in perfect accord with the experience of those who have successfully treated many cases of weak foot in the child. But in the general sale of commercial appliances, the noncompliance with the essentials of scientific treatment has led to an unmerited condemnation of supports as a whole.

The specific objections against market appliances are easily evident so far as the treatment of the common weak foot is concerned. In the first place, their construction is based upon a few fixed patterns that cannot meet the indications as to fit and correction in the varieties of weak feet. With teeth by way of illustration, the community would deride the idea of patronizing an establishment that professed to sell well fitting stock teeth, realizing that each case requires specific preparation. The public is not yet aware that the variations in the case of the feet are just as numerous. Again, it is assumed in these stock supports that the arch has broken down, and that it needs to be lifted up. No provision is made for the exact and powerful lateral pressure essential for correction. Merely pressing upward cannot correct a laterally displaced arch, and only furnishes relief to the ligaments while the arch remains tilted. Between the ligamentous strain which where present is temporarily relieved, and the assurances of the salesman of perfect cure, further neglect ensues with a loss of time and money.

One excellent adjunct in complying with the requirements of correction without immobilization is the Whitman plate with a higher inner flange and a smaller and lower outer flange, the flanges being devised to exert the necessary lateral pressure to counteract the tilting of the os calcis. This brace, of course, is to be made over a plaster positive of the foot. The cast should be taken with the foot at right angles to the leg and slightly inverted. The element of overcorrection, often essential for cure, is secured by careful deepening of certain points on the positive to obtain extra pressure where desired and before the final construction of the plate over this positive. When viewed plantarwise, the plate should terminate behind the head of the first metatarsal, run thence diagonally across foot to the outer flange situate at the posterior lateral surface of the foot, and the rear margin running transversely across the bottom of the foot a little in front of the back curve of the heel. When thus constructed and properly adjusted, it may be safely worn without any interference to function. At the same time it acts as an effective reminder to the child to maintain the correct attitude by making the assumption of the weak foot pose painful. Proper accompanying treatment now facilitates cure because the relaxed structures are prevented from lengthen-

ing in standing and walking and thus given an opportunity to shorten structurally. The assumption of the normal foot attitude is also materially enhanced and made habitual because the improper pose cannot be assumed. The support should be discarded when the correct attitude is assured, but care to be continued for a while to attitude, exercises and footgear.

Though appreciating the seeming logic of those who argue for physiological treatment solely in preference to any arch supports, there are considerations with respect to weak feet often overlooked that often justify support by braces as a measure of prime value. Weak feet by referred misalignment often occasion stumbling and falling, together with general mechanical strain. This stumbling and strain exist as omnipresent mediums for a possible tuberculosis of bone or joint which in childhood is commonly consequent to trauma. But stumbling, falling or strain are immediately checked and normal balance and locomotion promptly effected by proper bracing. On the other hand, physiological treatment cannot always check this faulty balance and strain, but must await actual correction. Besides, by a scientific preparation of the positive before making the support, overcorrection of the condition through extra pressure against the heel bone can be obtained and the value of overcorrection in treating any deformity so as to secure perfect correction is axiomatic in orthopedic practice. As with the pro and con of many other questions, the actual truth exists between both sides of the argument, and to my mind there has been as much of too little use when warranted of supports as well as an excessive dependence upon such appliances.

The cure of the weak foot is almost invariably assured by the proper application of the foregoing principles of treatment. Where it is apparent that the weak feet are associated with a general lack of tone, treatment of the general weakness is naturally indicated, but never without attention to the local condition which too often survives. The length of time required for a cure varies from a few weeks to several years. Such factors as excessive weight, general weakness due to disease or otherwise, lack of cooperation on the part of patient or even child, are examples of causes that may delay ultimate cure.

CONCLUSIONS.

1. The feet of children should be examined when walking begins, to determine whether abnormalities exist that require attention.
2. Routine examinations of children by physicians or pediatricists should include observation of the feet as a possible source of contributing factor to disability or ailment.
3. The feet of children in public schools should be examined periodically by duly qualified specialists as is now done with the other organs.
4. A greater number of clinics for the particular observation of children's feet should be established.
5. The diagnosis of foot ailments in the shoe store should be prohibited by legislation.

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CONGENITAL MEGACOLON (HIRSCHSPRUNG'S DISEASE).

*With a Report of a Case in Twins.**

BY JOSEPH POPPER, M. D.,
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The cases I am about to report are true cases of congenital megacolon of the type often referred to as Hirschsprung's disease. In 1880 Hirschsprung first called attention to this condition and published his complete exposition of the subject in 1896. Cases were reported in this country before 1880, but the first authoritative study of the subject in this country was made by Finney in 1908. The literature abounds in reports of so-called Hirschsprung's disease and the condition is now so well recognized as to be treated in most textbooks on pediatrics.

However, lest it be imagined that the disease is fairly common, I should like to state that of the abundance of reports and studies on the subject many of them concern another condition which is probably acquired and not congenital in the same sense as the cases described by Hirschsprung, and which form the basis of this report. Thus in speaking of the condition congenital megacolon one should distinguish between the two types.

The first or Hirschsprung's type of congenital megacolon is characterized by the following symptoms and signs beginning at birth or shortly after birth: Obstinate constipation, marked distention, active and visible peristalsis, and finally accompanied by symptoms of intestinal toxemia. This type, according to recent investigators, begins as a definite pathological entity from birth, the large intestine being both dilated and hypertrophied from the beginning. This type is extremely rare and is usually fatal in a short time in most cases. As evidence of the infrequency of this condition I may state that in a personal communication Dr. Rongy and Dr. Aranow, attending obstetricians to the Lebanon Hospital of this city, assured me that they had never seen a case in their many years of service in the hospital, and that there was no record of any case having occurred in the hospital during its entire existence, a matter of over a quarter of a century and covering many thousands of births. That it is more common than the published reports of authentic cases would indicate is very likely, for undoubtedly many deaths from this disease are reported as due to intestinal obstruction, as was the case with one of the twins reported below.

The other type, and one which is by far much more commonly met with, is that which begins late in infancy or in early childhood, characterized by abdominal enlargement and severe constipation with its associated symptoms. It probably has a different pathology in that it is probably acquired and not congenital and is secondary to some spastic condition of some part of the colon with resulting dilatation and hypertrophy of the gut immediately above it. It is analogous to the hypertrophy and

dilatation of the stomach secondary to pylorospasm. For the same reason it differs from Hirschsprung's disease in its amenability to treatment. Thus Meyers (1) succeeded in relieving the patients in a series of cases by proper diet and the administration of atropine just as Haas (2) has successfully treated pylorospasm. Other measures have likewise succeeded, such as exercise and posture and local treatment. Thus far only operative interference has offered any hope in the treatment of Hirschsprung's disease, but as yet the mortality from such treatment is extremely high.

HISTORY.

This history practically concerns only one of the twins, for the other had died shortly before I arrived at the patient's home. However, from the previous history and from a superficial inspection of the dead twin, I am convinced that death was due to the same malady from which the live twin is now suffering.

The twins were females who came under my observation on the fourth day of life. This was the mother's fourth pregnancy, and birth took place at full term, delivery being normal. Birth weight of the patient, five pounds eight ounces; that of the dead twin, three pounds eight ounces. The family history was negative. From birth on the history was one of progressive intestinal obstruction, the symptoms and signs being identical in both up to the fourth day. Neither infant had passed meconium nor expelled flatus since birth, in spite of cathartics, enemata, and various other measures. After the first day attempts at nursing were unsuccessful, and even water was not retained. Vomiting steadily increased and on the third day the vomitus consisted of black stained fluid. Weakness, loss of weight and distention soon became quite marked. On the fourth day the distention had assumed such proportions as to interfere with the cardiac action, with resulting cyanosis and, in the case of one of the twins, death.

I arrived on the scene shortly after the death of one twin, and inspection of the live one revealed an infant practically in a moribund state. This child was markedly cyanosed, the abdomen was tremendously enlarged, the breathing was shallow, the extremities cold, the radial pulse imperceptible, the heart rapid and feeble. The diagnosis occurred to



FIG. 1.—Case of Hirschsprung's disease in one of twins, at five months.

me after taking the patient's temperature, which was 96° F. I experienced a slight difficulty in passing the anal sphincter, and after the thermometer was within the bowel it seemed to me that the gut was unusually roomy. I then withdrew the thermometer and in its place inserted a glass test

*Read before The Bronx County Medical Society, December 16,

tube about four and a half inches long and three eighths of an inch in diameter. This tube also had to be forced through the anal sphincter, and when in the bowel I was able to make wide excursions with the free end of the tube within the gut. Holding the tube in place with my right hand, I



FIG. 2.—X ray photograph showing markedly dilated colon.

proceeded to exert considerable pressure with my left palm on the distended abdomen. Presently a large amount of fluid mixed with meconium and gas was expelled past the tube. I continued this treatment until the abdominal distention was almost completely reduced. The relief experienced by the infant was immediately apparent, the heart action improved, the cyanosis cleared up, the breathing became deeper, and within less than an hour water was retained by mouth and the baby even made an attempt to take the breast.

Inspection of the abdomen after the distention was reduced revealed the presence of active peristalsis throughout, a large wave extending from the right iliac region up and across and down the left side, seeming to follow the course of the colon and several smaller waves going across the centre of the abdomen from left to right. At the same time on palpation through the thin abdominal wall and especially in the centre of the abdomen, which was the seat of diastasis recti, one could grasp the thickened and enlarged coils of intestine. There was no doubt of the fact that the gut was hypertrophied to the touch. The diagnosis was verified by fluoroscopic examination as well as radiograph made when the baby was sixteen days old. (Fig. 2.) A complete physical examination made on the fifth day of life revealed only one other abnormality, viz., a distinct but not very loud systolic murmur at left pulmonic area transmitted to the back.

SUBSEQUENT HISTORY.

At the time of writing my little patient is twenty-eight weeks old. During that short period she has led a very eventful and precarious existence. On several occasions she was at the point of death. Her bowels have never moved completely without assistance. Occasionally she would have a spontaneous movement. At three different times as a result of intestinal toxemia she has had severe convulsions, vomiting, fever, distention, and generalized edema. Her stools at this time would contain a considerable amount of mucus and blood. On the other hand, on two occasions such severe diarrhea developed that in about twenty-four hours her body became practically dehydrated. When four weeks old she contracted a pneumonia involving the right upper lobe and lasting about two weeks. At eight weeks an abscess developed in the lower central abdominal wall which discharged through the umbilicus, probably an infection of the patent urachus.

Most of her severe ailments occurred during the first three months. Following that she seemed to be getting along fairly well until when five months old a severe eczema developed, involving the scalp, face, and elbows, and resulting from the addition of fruit juices to the diet. This has improved considerably since correcting the diet.

Her weight curve with many interruptions has continued to ascend, so that today she weighs eleven pounds three ounces. With gain in weight her abdominal muscles have lost their thinness, so that one can no longer grasp the hypertrophied coils of intestine, but peristalsis is still visible and distinct. The cardiac murmur also has persisted.

The treatment of this case has been and still is beset with great difficulty. In the feeding of this baby I have tried breast feeding, mixed feeding, dry milk and whole milk dilutions. For the past five months she has been doing best on whole-milk diluted with very thin barley water and with the addition of very little sugar in the form of lactose. Other sugars have been tried, but they always produced a great deal of fermentation with resulting increase of distention. She has also been getting lately zwiebach or toast with milk and water and stewed fruits. In attempting to treat the local condition I have used without success atropine, pituitary and suprarenal extracts. The only measures that have succeeded in keeping this baby comfortable thus far are a proper diet, an abdominal binder, and the daily use of saline or sodium bicarbonate irrigations assisted by abdominal massage.

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628 EAST 163RD STREET.

The Malnourished Child in the Public School.—William R. P. Emerson (*Boston Medical and Surgical Journal*, June 24, 1920) names in order as the five principal causes of malnutrition, physical defects, lack of home control, overfatigue, improper food habits, and improper health habits.

THE PHYSICAL SIGNS OF PNEUMONIA IN CHILDREN.

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The diagnosis of pneumonia in infancy and in early childhood is distinctly by physical signs. We cannot conceive of a pneumonia without some form of consolidation, and consolidation means a change in the physical notes from those of the normal chest. Of course, pneumonia being a severe acute illness involving the lungs, we may feel that from the subsidiary symptoms, especially the external respiratory changes and the severe toxemia that usually accompany this illness, a diagnosis can be suspected without awaiting the physical signs. That may be true to a considerable degree in adults, but in children these symptoms are too variable to be dependable, and frequently an error in diagnosis creeps in if relied upon, for rise of temperature, rapid pulse, rapid respiration, are not unusual in other febrile conditions of childhood, and even dilatation of the *alæ nasæ* is frequently encountered, especially in affections of the upper respiratory tract. Toxemia, an accompaniment of pneumonia in adults, giving an early clue to the probable affection of the patient, is also a most varying symptom of pneumonia in children, and in fact is just as frequently absent as present, and even in the apical types of pneumonia where it is usually expected it is not infrequently absent.

In the diagnosis of the various febrile conditions temperature plays its important rôle. In adults especially the temperature curve is often of great assistance in particular diseases, and long before other symptoms are elicited this curve will suggest the most likely diagnosis. This is particularly true in the pneumonias and even in differentiation of the lobar and bronchopneumonic types—the temperature will often be sufficiently characteristic to be of assistance in the separate diagnosis. However true this may be in adults, the same cannot be said of the pneumonias in children. It is true that the temperature curve frequently follows the typical course of the pneumonias in adults, but as a general rule other febrile conditions in childhood may act similarly, and we therefore cannot definitely determine the diagnosis in the absence of physical signs. Who has not seen in a case of ordinary grippe the temperature run high for several days and then suddenly drop to normal? For example, a child eight months old has a sore throat, with fever. The temperature rises quickly to 103° and 104°, remains that way for five days, and then falls to normal within twelve hours, the closest examination not revealing the slightest sign of pneumonia. Who has not seen in similar conditions in childhood, the temperature run high and then come down to normal, either slowly or suddenly? It may be argued, of course, that such temperature may be indicative of consolidation, although we are unable to elicit the signs, but whatever the reasons a diagnosis of pneumonia under such conditions is made on hypothesis only and not on positive data; for in institutions with radiographic facilities it can be shown

that many of these so-called pneumonias are not pneumonias at all.

My observation has been, however, that the characteristic feature of temperature in febrile conditions in childhood is its extreme irregularity and our thorough inability to read symptoms into the curve the same as we do in adults, this holding true even in the pneumonias in children; for instance, a lobar pneumonia, contrary to our expectations, may run wide variations, and either suddenly or gradually reach normal, while often in a case of bronchopneumonia, with all the typical signs of this disease, the temperature may remain high with slight remissions for several days, and then suddenly or slowly reach normal.

In Case No. 7764, a child, aged eight years, typical signs of bronchopneumonia developed; for eight days the temperature curve remained typically lobar in type, for five days variations became wider, and then the temperature suddenly reached normal. There was an uneventful convalescence. If there is any similarity between the temperatures of lobar and bronchopneumonia it is the fact that, although variations in temperature may be wide in both instances, in bronchopneumonia they may touch normal or even subnormal, while in lobar pneumonia they usually do not reach normal, although at times they do. In fact, it is not always an easy matter to differentiate between lobar and bronchopneumonia, for only too frequently bronchopneumonia is limited to one lobe and is massive in character. From the physical signs and the variations in temperatures that may be present in either form, it is utterly impossible to differentiate the two conditions, although when the temperature is normal we may suspect a bronchopneumonia. In other words, from the subsidiary and subjective symptoms alone it is unwarranted to make a positive diagnosis of any form of pneumonia. This is as it should be, for, in justice both to ourselves and to our patients, we should not make a positive diagnosis on impressions alone. Changes in the lung produce sufficient acoustic changes for us to recognize them, and our failure to do so lies rather in our inability to recognize these changes than in their absence, and also because of the false acoustic principles which we have been taught and which have been retained by many of us.

It will be appropriate here, before I consider the physical signs of pneumonia in its different stages and varying forms, to say that central lobar pneumonia does not exist and we are only besetting ourselves with difficulties when we reach such a conclusion. If a pneumonia is present we can find it, and it is only the varying and finer acoustic changes that occur that make it difficult for the busy practitioner to recognize them. We must recognize, too, the great acoustic principle that pitch remains unchanged only if it travels through a uniform medium and that it will promptly change if the medium changes. In other words, a note traveling through an air containing lung will not change its pitch by striking a consolidated area, for the consolidated area cannot act the part of a condenser and rechange the vesicular note to a bronchial note.

We must remember that the bronchial breathing we hear in pneumonia is really the tracheal tubular breathing produced in the larynx and trachea transmitted unchanged, as far as pitch is concerned, through a consolidated area of uniform medium, but to produce this physical possibility the consolidation must extend down to the hilum of the lung or be at least in connection with a fair sized bronchus so that the tubular breathing can go through unchanged. If the note first enters the lung and becomes vesicular, it remains vesicular even though it may later impinge upon a consolidated area, for the consolidated area has no physical means of re-changing the pitch. This law of sound explains the many varying physical signs of pneumonia, and also explains why the bronchial breathing is delayed or even absent in some cases. Another point it is well to emphasize is that pneumonia begins with a wedgeshaped triangular patch with base at surface of lung and apex pointing inward, and whether bronchial breathing will or will not be heard depends upon whether the consolidated area is in communication with a bronchus or has reached the hilum of the lung. These assertions are not merely theoretical; they are very practical, and our success in finding a pneumonia patch will depend on our knowledge of these two facts, for otherwise, expecting some change in the auscultatory note, we will overlook a slight grade of dullness indicating a pneumonic area.

As an instance of the difficulty of diagnosis we may cite the case of a child treated by Dr. H., who for three weeks had had a cough and a temperature with wide variations. Several consultants expressed various opinions, and it was finally thought that the case was one of malaria, as the child came from a malarial district and the blood examination revealed suspicious bodies. I was asked to see the child. I discovered a dull patch in the left subclavicular region, but normal vesicular breathing was present. Diagnosis of pneumonia was confirmed by radiographic findings. Similarly in Dr. A's case a right apical dullness developed, lasting ten weeks, but at no time was bronchial breathing to be heard. This was also confirmed by radiographic findings.

With these facts in mind I may say that in the diagnosis of early pneumonia the percussion note is the most important sign to be depended on. We must remember, too, that a child's chest is very resilient and its lungs highly elastic, and a slight change in percussion note will often be overlooked unless we use the lightest stroke so as to throw as little of the surrounding chest into vibration as possible. The child must be placed in a position, preferably supine, so as to relax the entire musculature of the chest thoroughly, otherwise tension of the muscles on one side will give a higher note, with the possibility of a mistake in diagnosis. In the early diagnosis we must not depend on any auscultatory assistance for even râles in the pneumonias of childhood are as often absent as present. A child may go through a pneumonia without a râle and even in the stage of resolution none or very few râles may be heard. Because of this marked variation of the presence of râles I teach

my interns not to place too much interpretative value on râles in a chest. They indicate a pathological process, but the exact nature of this process it would be difficult to state because of this variation. As the process continues the auscultatory changes begin to come to the fore. The breathing becomes high pitched, bronchovesicular, and then bronchial, with or without râles.

All that has been said above holds true for the lobar type of pneumonia and not for the bronchopneumonia type. Because of its different pathology and the usually accompanying bronchitis the patches are frequently too small to be detected by percussion note, and, for that matter, even for the radiograph. Frequently, with otherwise positive signs of bronchopneumonia, a radiograph will often be negative, and we, therefore, have learned to expect little confirmation from the x ray findings, and unless the patches become confluent and more or less massive we can find few signs except those of a fine bronchitis. Because of this bronchitis with tenacious mucus in the finer bronchioles, unaffected lung vesicles about the bronchopneumonic patches may be put in a state of atelectasis or high tension and, therefore, either apparently extending the consolidated area, enabling us to obtain a dull note, or overshadowing the bronchopneumonic patch, giving a hyperresonant note. Aside from these slight percussion changes in nonconfluent bronchopneumonia we have little to expect in the way of physical signs except those of a bronchitis. As far as bronchial breathing is concerned it is most frequently absent for the very reasons I have explained that the patches are usually noncommunicating with a sufficiently sized bronchus, or have reached the hilum of the lung.

The physical signs of resolution in lobar pneumonia in children are somewhat different from those in adults. As a rule, resolution in adults takes place *en masse*, a quick liquefaction of the consolidated area and the presence of the characteristic râles *redux*. In children the same thing may occur, but just as often the resolution is a slow process extending from three to seven days, the percussion note and bronchial breathing if present slowly diminishing in pitch until normal vesicular sounds are heard. Here, too, râles play an unimportant rôle, for frequently a child will go through the resolution stage with very few râles or none at all.

Z. F., six years old, entered the hospital with a right lower lobar pneumonia. Temperature receded by lysis, but during the entire course of the disease scarcely a râle was to be heard. In other words, aside from the critical descent of the temperature, the physical signs may remain unchanged, but if the descent of temperature is gradual we have no means of telling from the physical signs alone whether the patient has entered the crisis or not. Another variation from the adult I have noticed is that after complete resolution has taken place in lobar pneumonia without any demonstrable concomitant pleurisy, there often persists a certain degree of dullness which lasts for a varying time and which may be wrongly interpreted as of some pathological significance, as I shall point out later.

The great bugbear of pneumonia in children is

the complication of fluid, either serous or purulent, usually the latter. According to our textbooks with the description of the so-called classical signs nothing should be simpler than a diagnosis of empyema. Aside from the falsity of some of these so-called cardinal symptoms, I know of no more perplexing situation than a diagnosis of empyema, and often even in spite of radiographic examination, an exploratory puncture must be made to settle the question, and that even is often not conclusive.

Patient, M. B., a boy, nine years old, went through a typical lobar pneumonia of the right lower lobe; crisis occurred at the end of seven days, but physical signs persisted. Despite fourteen negative punctures, negative radiographic findings, and consultations aplenty, it was finally decided that the boy is suffering from tuberculous pneumonia and should be sent away. Having followed the case very closely, I maintained that the child had the physical signs of fluid despite our negative findings. The fifteenth puncture finally revealed pus, and an operation by Dr. R. showed an ordinary empyema, and that not even of the encapsulated type.

PHYSICAL DIAGNOSIS.

The physical diagnosis of empyema should be considered from two angles, first, ordinary empyema with the ordinary amount of fluid, and secondly, the type with considerable fluid of long standing, for both have distinctive symptoms. In the first place it should be remembered that the child's lung is very resilient and that it takes considerable and continuous pressure to compress it. This is of prime importance for, because of this physiological fact, the signs at least of moderate empyema have not the auscultatory note (bronchial breathing) we are taught to believe. Secondly, for the same reason empyema fluid spreads out over the affected side like a sheet on the posterior surface and does not collect underneath the lung to form the so-called spiral line. With this in view we can see why there is little compression of the lung and slight displacement of the abutting organs, especially the heart. Again the upper edge of the empyema fluid has a tendency to form adhesions, making the condition an enclosed sac and abolishing, therefore, the tendency to a change of percussion note with change of position. However, I have noticed that this tendency to fibrin formation shutting off the fluid is absent along the spine, thus giving the fluid a chance, with change of position, to flow into the reflected portion of the pleura along the spine (mediastinum), with a corresponding change of the percussion note. This I have called the "ribbon sign" because its width is about that of ordinary baby ribbon. I have been able to demonstrate this in about ten cases, but the number is far too few to be of positive value. I believe, however, from the experience already obtained, that the sign will be of value in recent cases of empyema, but in old standing cases with fibrin formation even along the inner edge of the fluid it will not aid us.

In the ordinary type of empyema the percussion note is of prime importance. The note is dull but more often flat, and the flat note in itself is suspicious of fluid. Unless we are dealing with a localized encapsulated or intralobar empyema a dull

note becoming progressively deeper as we reach the base is always suspicious in postpneumonic conditions. If the pneumonia has been thoroughly resolved, the auscultatory note, though somewhat diminished in intensity, will be vesicular in type or only a slight variation from the normal in pitch. We should not expect bronchial breathing, as the textbooks tell us, for the fluid overlies the lung and the lung is too resilient to be compressed in order to obtain the bronchial breathing. For the pneumonic process having resolved we will need a compressed or nearly compressed lung to obtain the uniform medium for the transmission of the bronchial breathing, as I have explained above. For the same reason we do not get a displaced heart or one so slightly displaced that for ordinary percussion it would be difficult to appreciate. Therefore a dull or flat note following an otherwise frank lobar pneumonia with no or but slight vesicular changes, with little or no displacement of the heart, and with a possible ribbon sign, is justifiably a procedure for chest puncture.

EMPHYEMA WITH FLUID

In types of empyema with considerable fluid, or in those of long standing with distinct fibrin formation, along the edges of the fluid and where the lung is finally compressed, the signs are all those of a frank lobar pneumonia with the exception that in this type the heart is usually displaced. Here we have the dull or flat note, bronchial breathing, bronchial voice, etc., but here too we are assisted by a little pathological anomaly which is frequently forgotten. This was pointed out to us by the late Dr. Hodenpyl, and consists of the fact that the very apex of the lung is as a rule uninvolved in lobar pneumonia, and when a dull or flat note is present there we are dealing with some other condition, such as bronchopneumonia, tuberculosis, or with a compressed lung, so that with a previous history of a lobar pneumonia, with signs still simulating a lobar pneumonia, a dull or flat apex displaced heart, we can only diagnose empyema but an empyema of long standing or of considerable fluid.

In differential diagnosis between empyema and other conditions we have to consider the possibility of bronchopneumonia of lower lobe of more or less massive involvement where bronchial breathing was absent, or even the possibility of a lobar pneumonia where the consolidated area about the hilum has resolved more quickly than the rest of the affected lung and eliminating the pure bronchial breathing. Under such conditions the previous history with the physical signs will be of great assistance.

In conclusion, let me say that the diagnosis of either pneumonia or empyema is as a rule not difficult. It is only necessary to unlearn some of the false teachings of our textbooks and to remember that to obtain bronchial breathing we must have a uniform consolidated area extending to the hilum of the lung or in communication with a bronchus, and that the apparent variation in the physical signs results from the failure of the original tracheal breathing to reach a uniform consolidated area and be transmitted unchanged.

1323 MADISON AVENUE.

A NEW SITE FOR SMALLPOX VACCINATION.

BY I. H. GOLDBERGER, M. D.,
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The ugly looking, hideous and disfiguring scars that result from vaccinations against smallpox prompted me, many years ago, to discontinue the use of the outer side of the arm as a site for the inoculation against this disease. Others, too, realizing that visible scars on the outer side of the arm were objectionable esthetically, especially in girls and women, found that by vaccinating on the lower extremity (thigh, calf, etc.) the objection was partially overcome. The selection of this latter site overcomes, partially, the objection to the visible scar, but, on the other hand, in infants the danger of local infections resulting from wet and soiled diapers is frequent and serious enough to make the lower extremity objectionable, also as a routine site for vaccinations. Then, too, infants and young children are in the habit of being bathed daily, and if they are vaccinated on the lower extremity, this hygienic measure has to be interrupted for at least a period of fourteen to twenty-one days. This feature alone, aside from the possibility of local infections, contraindicates the selection of the lower extremity as a routine site for vaccinations.

For the past seven years I have used the inner and back side of the arm as the ideal site for vaccination against smallpox. In this manner I have overcome the objection against a visible scar. I have vaccinated over five hundred children, and in spite of the fact that the vaccination was made near the lymphatics of the arm, in not a single case did enlarged glands develop in the axillæ. Possibly this has been because the vaccinations have been free from secondary infections and because the vaccination is not performed over muscle fibres, the frequent contractions of which are apt to cause irritation and deep induration involving skin, fascia and groups of muscles. Vaccinating over the loose, fleshy portion of the arm, not directly over bone or muscle, has resulted in less inflammation, induration and infection than that which follows vaccinations over muscle and bone areas.

The vaccination scars in my cases are so small and so superficial that in a hurried examination of the arm the scar is apt to be overlooked entirely. This fact was emphasized recently when, during a survey of the public schools of the City of New York by medical inspectors of the Department of Health, many of my little patients were informed that they would have to be vaccinated because, on baring the arm, the scar was overlooked.

The method I employ is as follows: After the arm has been properly cleansed, the forearm is flexed at right angles to the arm and the vaccine is applied below a line midway between the internal condyle of the humerus and the anterior axillary line. A Von Pirquet platinum borer is turned once or twice through the vaccine virus. The virus is permitted to dry thoroughly before placing over the abrasion a sterile pad of gauze, held in place by two wide strips of adhesive plaster.

In my opinion, the inner and back side of the

arm is the ideal location for the inoculation of smallpox virus, for the following reasons:

1. It leaves no visible scar.
2. It does not keep children from having their daily tub bath while the vaccination is passing through its various stages.
3. There is little or no exposure to infection from outside sources of infection.
4. It minimizes possibilities of trauma.
5. There are no infiltrations, extensive indurations, sloughings, or extensive scars.

2562 GRAND CONCOURSE.

Public School Clinics in Connection with State School for the Feeble-minded.—Edith E. Woodhill (*Mental Hygiene*, October, 1920) presents a report of the public school clinics established in Massachusetts, in connection with the weekly outpatient clinics at the Massachusetts School for the Feeble-minded, at Waverly. The cases seen at the clinics are mostly children of school age, without special character defect, selected for examination because of backwardness in the grades or truancy, while a large number of those presented at the institution clinics are borderline cases that have become problems on account of social or moral delinquencies. The organization and method of conducting these school clinics are similar to those used at the clinic at Waverly, and the methods of diagnosis are the same. The staff of examiners, consisting of a psychiatrist, a psychologist, a teacher, and a school nurse, visits the various schools monthly. These school clinics benefit the child by helping the teacher to understand the mentality of the feeble-minded pupil and the kind of training needed. They serve the school by selecting children for special classes and taking out feeble-minded children who are incapable of making more progress. They serve the community by advising and instructing parents as to home care and supervision, and by helping to take out of the community the feeble-minded who need institution protection and training and who may become a menace to the community. With the exception of a few idiots, all feeble-minded children pass the public schools at some time. If systematic examination of all the retarded children in the public schools could be made, in time there would be a complete registration and census of all the feeble-minded.

Massachusetts has passed a law requiring a mental examination of all children three years retarded. Partly on this account, the need for more school clinics has become so pressing that the work has been broadened and a traveling clinic is now being organized by the Department of Mental Diseases. A staff of experienced examiners will spend their entire time in this work. They will visit various sections of the state, in turn, making surveys of the schools in these sections. This is part of a constructive program for better care of the feeble-minded of the entire state. The benefit of a school clinic is not all on the side of the schools and the community. It is a distinct advantage to an institution staff to come in contact with these school problems and this number of undiagnosed cases.

Editorial Notes and Comments

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LATENT SINUSITIS IN CHILDREN.

While infective sinusitis in adults, associated, as is usually the case, with symptoms suggestive of a sinus infection, is commonly suspected and diagnosed, similar conditions arise in children of all ages, but are more prone to remain undiagnosed unless attended with acute or manifest symptoms. Acute sinusitis in infants is rarely localized, but involves the nasal mucosa and the relatively undeveloped sinuses as a whole, usually with symptoms of purulent rhinitis, which may become chronic or subside into a recurring nonpurulent nasal catarrh, or eventuate in recovery; or, on the other hand, the process may finally produce a large area of external suppuration, as described by Skillern. In children between the ages of five or six and fifteen years, a nasal sinus infection is more likely to be localized and occasionally present symptoms such as lead one to suspect nasal sinusitis in adults. A chronic or recurring nasal catarrh in a child is usually attributed correctly to adenoids or to infected tonsils, and, if the symptoms persist after an operation for the removal of the offending organs, the child is sometimes supposed to have a recurrence of enlarged tonsils and adenoids, so that a second, not to say a third, operation is sometimes performed.

The symptoms of chronic latent sinusitis are essentially similar to those of infected tonsils and adenoids, namely, a recurrent nasal catarrh, buccal respiration, catarrhal deafness, aprosexia, mental backwardness and chronic sepsis. In the sphenoidal sinus cases especially, other manifesta-

tions may arise, such as restriction of visual and color fields, as has recently been pointed out by Watson-Williams, but if they are not suspected and sought for, these symptoms will be overlooked. More serious results of chronic sinus infection are those of infecting bacteria passing continually, on the one hand, into the gastrointestinal tract, and sometimes infecting the appendix; on the other hand, the bronchi and lungs may become involved.

A persistent anterior unilateral nasal discharge is highly suggestive of sinus infection, provided the presence of a foreign body can be eliminated. A posterior rhinoscopic view showing pus or mucus in one choana is similarly strong evidence of a nasal sinusitis. It is necessary to make examinations on more than one occasion to eliminate the possibility of an adventitious collection being mistaken for a persistent secretion. According to Watson-Williams, the most useful methods of examination are endorhinoscopy and exploration of the sinuses by the suction syringe. Endorhinoscopy in children over seven years of age is often possible with local anesthesia, but, on the other hand, it is often impossible without general narcosis. When a definite streak of pus is seen coming from the sphenoidal region or from the middle meatus of one or both sides, the evidence of the corresponding sphenoidal or antral cavities being the source of the purulent discharge is almost conclusive.

Exploration of the maxillary antra or sphenoidal sinuses by means of the suction syringe is most valuable, but necessitates a general narcosis in children. Unfortunately, the exploration of the sphenoidal sinuses in young children is far less easy than the exploration of the maxillary antra, and is not so free from risk. Nevertheless, the exploration of the sphenoidal sinuses in children is usually a fairly easy and safe procedure, provided one is accustomed to such investigations in adults.

DRIED MILK AS A FOOD.

When the great number of women in America who do not nurse their babies and who rely on substitutes for mother's milk to feed them is taken into consideration, it is obvious that the greatest care should be taken in the selection of a substitute. Upon the proper rearing of a child during the first few years of life depends largely its future health. Also upon the proper rearing of children in the mass depends the health and therefore the prosperity of a nation. Of course, the most common substitute for an infant's natural food is cow's milk modified

in the manner which the medical attendant, as a rule, prescribes. But even when the most careful attention is paid to obtaining a milk as uncontaminated as possible, there is no certain guarantee that this end is always achieved. Sterilization and pasteurization both have their drawbacks, and therefore any substitute for mother's which possesses the nutritive properties of cow's milk and which, in addition, can be guaranteed as absolutely clean and free from hurtful germs, would be hailed with acclamation by all those who have the health of the people at heart. By some it is asserted that dried milk possesses these attributes, which are absent in many instances from milk transported considerable distances and probably subject to contamination or perhaps infection before it is used as a food.

Among those who have recently spoken in favor of dried milk as a food is Col. R. J. Blackham, M. D., who gave an address on the matter before the British Sanitary Congress, held in Birmingham in August last. Blackham has had much experience in the use of dried milk in the British army and in civil life, and his conclusions are valuable. His address was somewhat lengthy, as he dealt with the question from all aspects and minutely, so only the outstanding points will be discussed briefly. Fats are no longer in emulsion, but in a condition resembling butter and quite granular. When mixed with water the fat globules are considerably fewer and much larger than in fresh milk. Albumin and globulin are coagulated, but caseinogen is not coagulated. All observers are agreed that the protein content is more digestible than in fresh milk. The milk sugar is unchanged. The ferments are all destroyed, but Lane-Clayton has shown that this loss is of no importance as regards the value of dried milk for hand feeding of infants.

As for the vitamins, according to existing views an essential part of the infant's diet, Blackham points out that until Professor Halliburton found that some vitamins will stand high temperatures, it was generally thought that the milk vitamins were destroyed by the heat used in the process of manufacture. Funk, however, demonstrated the presence of vitamins in dried milk, and showed that there was sufficient of the antiscorbutic substance in boiled milk to supply the needs of infants, although some was destroyed by heating. Leonard Hill goes further, and states that the antiscorbutic food accessory is not destroyed in boiled milk. Blackham draws attention to the fact that confusion seems to have arisen over failure to differentiate the three accessory growth substances all grouped together as vitamins, and goes on to show that fat soluble A is the antirachitic factor and it is present in all animal

fats, but absent from most vegetable oils. It is not affected by heat, and is therefore present in dried milk. Water soluble B is the antineuritic factor. It stands desiccation and is therefore present in dried milk. Water soluble C is the antiscorbutic factor, and here the very crux of the question is reached. Experiments at the Lister Institute show that the antiscorbutic property, which is poor even in fresh cow's milk, is largely diminished in the preparation of dried milk, whereas the results of American investigators—Hess, Fisk, Unger, and others—demonstrate that there is no diminution of this factor, and that they have actually cured cases of scurvy by the use of dried milk. It may be added that Dr. Eric Pritchard, the well known English authority on children's disease, has reported favorably on the use of dried milk as an infant's food, and that Blackham himself states that he has never seen infantile scurvy in a child fed on dried milk. Compared with fresh milk, numerous French and Belgian doctors consider it superior to sterilized cow's milk or even humanized cow's milk. Others regard it as a temporary diet to be given for a short time when other foods disagree.

The following is Blackham's opinion of this product: 1. In dried milk we have a valuable food which has a wide sphere of usefulness, not only in the feeding of infants and invalids, but in domestic and commercial cookery. 2. For use with tea or coffee it cannot be claimed that reconstituted dried milk is likely to be popular, and up to the present it has not been placed on the market at a price sufficiently attractive to induce the public to put up with the difference between the fresh and reconstituted article. 3. For use in the tropics and in places such as Malta, where cow's milk is unobtainable, and goat's milk dangerous, it has a large range of application, and on long voyages it presents many advantages over condensed milk. 4. For military purposes it will probably entirely displace condensed milk in future campaigns. It must be understood that milk should be scrupulously clean at the time of drying, for no process will make dirty milk into clean milk, and also the process should be carried on under the best sanitary conditions.

It seems that dried milk may be used to advantage as an infant's food mainly, perhaps, on account of its greater digestibility. It is difficult, often impossible, to so modify fresh cow's milk as to render it digestible to some infants. This is certainly a point in favor of dried milk. As for the other advantages claimed for this product as an infant's food, it may be said that while a good case has been made out for it, no decided verdict can be given. It must be tested further and on a wider scale.

MEN OF SCIENCE IN RUSSIA.

From time to time news filters through from Russia. Hysterical observers have given us their impressions and created a sentiment among the reading public. Countless reports, unauthentic and biased, have contributed to this feeling. We have come to believe that Russia is a savage country, inhabited by a barbarous horde bent on the extermination of themselves and all others with whom they may come in contact. Nothing is further from truth. The Russians are a peaceful, kindly people, and their men of culture have done much to enrich the world of science. At present the Russian people are suffering from privation and hunger. Their transport system has broken down. At best the country was not in a state of high development from the industrial point of view, and it is easy to see how seven years of warfare and an internal upheaval would cause the breakdown. But it is not our purpose to discuss the reasons. We shall only consider some of the actual conditions as reported by Wells, Brailsford, Lansbury, and other unbiased observers, and shall consider these conditions only as they pertain to the medical and scientific field, with perhaps a word of inquiry in regard to Red Cross activities.

First of all, let us consider an editorial in *The Freeman* of November 24, 1920, which emphasizes the horrible situation among men of science, including the medical profession in Russia. The following statement and appeal is made:

"Science is universal, like art, music, literature, or any other purely spiritual activity of mankind. There is no such thing, except for pure convenience of designation, as Russian science or American science; there is only science. The obstacles put by political government against the progress of science in Russia is primarily not a crime against Russia but against science; and it seems to us that men of science in the United States should not be backward about so declaring it. By all means supply the Russians with the literature they need; but let our men of science get out a manifesto, saying what they think about the unconscionable effrontery of the United States Government in the premises, and why they think it. That is what would help more than anything to set people thinking about the rightful place of science in the world."

This statement is made in response to the report presented by H. G. Wells, of which the following is an extract:

"If St. Petersburg starves this winter, the House of Science, unless meantime some special effort is made on its behalf, will starve too. But these scientific men said very little to me about the possibility of sending them supplies. The House of Literature and Art talked a little of want and miseries, but not the scientific men. What they

were keen about was the possibility of getting scientific publications. They value knowledge more than bread. Upon that matter I hope I may be of some help to them. I got them to form a committee to make me out a list of all books and publications of which they stood in need, and I have brought this list back to the Secretary of the Royal Society of London, which had already been stirring in this matter. Funds will be needed, three or four thousand pounds perhaps—the address of the Secretary of the Royal Society is Burlington House, W.—but assent of the Bolshevik Government and our own to this mental provisioning of Russia has been secured, and in a little time I hope the first parcels of books will be going through to these men who have been cut off for so long from the general mental life of the world."

As seen from the foregoing, steps have been taken by the British Government to feed, mentally, these men of science who are laboring for the good of all mankind. By the progress they make their results will one day be of service to us; it will save lives—our own, perhaps. So it behooves us, from a purely selfish point of view, to do all we can to enable them to continue their labors. We surely should not allow them to be segregated from the rest of the world. We should make an effort to get in touch with them; find out what they are doing, and supply their immediate needs—books, periodicals, and supplies to carry on their work. Perhaps our readers will have some suggestions to offer in this matter. We will welcome any that you may send.

Now a word in regard to the activities of the Red Cross. Here again we cannot do better than to quote George Lansbury (*What I Saw in Russia*, Boni and Liveright): ". . . for instance, Allied soldiers, in common with Russian, who have fallen into the hands of the Soviet Government, have had to suffer for months from neglected wounds, and undergo major operations without anesthetics because there were none in the country. Furthermore, without medical and sanitary supplies, diseases have become endemic in Russia, the public health of the entire nation being in jeopardy, and tens of thousands of preventable deaths occurring."

The following is taken from the introduction to Lansbury's book:

"Mr. Lansbury raises a question concerning the Red Cross. As an international organization, founded to administer relief and afford medical aid impartially wherever its services can be utilized, it has been supported by voluntary contributions from the people of the whole world. It is non-national, nonpolitical, and purely humanitarian in its origin, its organization and profession. But according to Lansbury it has given all aid to the Army Medical Corps in Poland; it has refused to give any aid to Russia."

As medical men we are not interested in politics. Our business is to prevent suffering and not to inquire into what form of government suffering men and women are obliged to live under. Here again we ask our readers to express themselves freely by writing to the editor of the *NEW YORK MEDICAL JOURNAL*, stating what they think should be done in the matter.

PHYSICIAN AUTHORS: DR. BERNARD
DE MANDEVILLE

History was repeating itself when, a few years ago, a flurry of interest was created by discovery of the fact that Joseph Conrad's incomparable sea stories were the work of a man who had had to learn the English language after he had grown up. That a man should attain such rare mastery of style and expression in English under such conditions was indeed unusual, but not unprecedented. Something over two hundred years ago Dr. Bernard de Mandeville, a Dutch physician, went to London when he was twenty-one years old to learn English. In a few years he was talking it so well that Londoners who did not know him refused to believe he was a foreigner. Moreover, in a few years he was writing English with the brilliancy of a genius. Dr. de Mandeville was born about 1670 at Dordrecht (Dort), Holland, where his father practised as a physician. He went to London shortly after his graduation from the University of Leyden on March 30, 1691, intending to remain there only a year or two. Instead, he spent the rest of his days there and became the most talked of writer in England. He amazed all men of learning by the boldness of his thought and the richness of his literary style. His *Fable of The Bees* was the literary sensation of the hour and became the storm centre of a controversy that was about as furious as any rumpus of its kind that ever raged in merrie England.

This controversy arose over the audacious doctrines that de Mandeville propounded with such vigor and lucidity. The moot point in *The Fable of The Bees* was that individual virtues are detrimental to the welfare of the state in its commercial and intellectual progress and that private vices are public benefits. This hypothesis at once set in motion a flood of attack and defense. Some said it was truth and others said it was twaddle. In the main, however, British intellectuals stigmatized this bizarre philosophy as false, cynical and degrading. The matter even reached the stage of a grand jury investigation, but nothing much ever came of that except that it stimulated de Mandeville, his supporters and his opponents, to fresh

onslaughts of debate. The jury investigation hinged largely on the charge that de Mandeville's book was oversalacious, and it must be admitted that even for that free-spoken day and age it was, to say the least, a trifle immodest and gross, particularly in those erotic stanzas wherein the genial Dutch doctor sought to fortify his paradoxical arguments by examples.

The *Fable of The Bees* was a satire in the Hudibrastic vein showing a society possessed of all the virtues and devoid of all vices falling into apathy and utterly paralyzed. It was a humdrum, sluggish world, this supervirtuous world that de Mandeville depicted—stagnant from lack of luxuries, miserable from absence of self-love and indulgence. In such a world, he contended, civilization marks time, comes to a standstill because there is nothing to stimulate society into action and progress, to arouse inventive ambition and keep up the proper circulation of capital. In teaching that men who restrain their selfish appetites and sacrifice their own interests for the public good are fools and dupes, de Mandeville anticipated a good part of the teachings of Nietzsche, the self-styled immoralist, who contended that all the conventional morality and traditional ethics of the human race are absurd.

As Chamber's *Encyclopedia of English Literature* points out, de Mandeville was at his best and nearer to modern views in his account of the origin of modern society. There is, in fact, a lot of sound reasoning in de Mandeville's fable outside his main thesis concerning virtue and vice. Contemporaries who attacked him condemned him throughout, but as has been pointed out by several critics in more recent times, it is mere prejudice to deny that he had considerable philosophic insight. Not all of his ideas were buncombe. Samuel Johnson says "de Mandeville opened my views into real life very much" and Macaulay was exceptionally loud in his praise of the ability of de Mandeville to trace the motives of human actions. Other defenders of de Mandeville point out that his antimoral speculations were not written with an immoral object but were rather the outcome of a playful desire to shock and divert his contemporaries. In one respect it may be said that de Mandeville was somewhat like George Bernard Shaw. It was well nigh impossible to tell at times when he was in jest and when in earnest. It is reasonable to suppose, however, that he more than half believed most of the things he advocated. There was, for instance, never any doubt as to his attitude toward free schools for the poor. He was absolutely against them. They were his pet aversion and he never tired of railing at them. When the first was founded in 1699 he con-

tended that if parents were too poor to afford their children the elements of learning the children should remain ignorant and the money could better be spent on the higher and professional education.

De Mandeville's first work was *Typhoon: A Burlesque Poem*, followed, in 1704, by *Aesop Dressed, or Fables in Familiar Verse*. Then came *The Grumbling Hive, or Knaves Turned Honest*. This was enlarged into *The Fable of The Bees* in 1714, and still further enlarged in 1723, at which time the Middlesex jury investigated it as a nuisance. There were two other editions of it during his lifetime. His other works include *A Treatise on the Hypochondriac and Hysteric Passions*, highly commended by Johnson; *The Planter's Charity* and *The Virgin Unmasked*, a work in which the coarser side of his nature is prominent; *Free Thoughts on Religion*, equally unpleasant in tone; *The Origin of Honor and Usefulness of Christianity in War*, and some disquisitions on the social evil.

De Mandeville practised medicine in London until his death, but his practice was, much of the time, secondary to his writing, from which he gained a large income. He was, incidentally, one of the first of the tribe of press agents. Even in those days the drys were active and King Gambrinus felt the need of an able pleader before the bar of public opinion. Dr. de Mandeville was that pleader and was well remunerated for his work by the brewery interests of London. The genial old doctor spent much of his time in their tap rooms. It was in one of these that Benjamin Franklin met him and found him to be "a most entertaining, facetious companion."

News Items.

Anthrax.—During October, 1920, one case of anthrax was reported in Washington, one in Maine, and two in Pennsylvania. During November two cases were reported in Massachusetts. During the week ending November 20, 1920, one case was reported in Lowell, Mass., and one in Bloomfield, N. J.

Hospital for Women to Be Opened in Pittsburgh.—The Elizabeth Steel Magee Hospital will be opened in Pittsburgh early next year as a general hospital for women. The construction and endowment of this hospital were made possible by a bequest of \$3,000,000 by the late Christopher Magee.

Borough Park Residents Object to Hospital.—An injunction has been asked by a number of residents of the Borough Park section of Brooklyn to restrain Dr. Philip Mininberg from building and maintaining a maternity hospital on his property at Forty-fifth street and Fifteenth avenue. They assert that the hospital is undesirable and would lower property values.

A Nutrition Clinic in the Far West.—The Anti-tuberculosis League of King County, Wash., has established a nutrition clinic in Seattle, which is said to be the first of its kind established in the Far West by an antituberculosis organization.

National Tuberculosis Association.—The seventeenth annual meeting of this association will be held in New York, June 13th to 17th, with headquarters at the Waldorf-Astoria. Mr. Homer Folks is chairman of the committee of arrangements.

New York Neurological Society.—A stated meeting of the society will be held on Tuesday, January 4th. Dr. E. David Friedman will present a case of Dyspituitarism with Hypertension, and papers will be read by Dr. Charles Rosenheck, Dr. George H. Kirby, Dr. L. Pierce Clark, and Dr. Philip R. Lehrman.

Diphtheria in New York.—During the four weeks beginning October 23rd and ending November 20th, 1,354 cases of diphtheria were reported to the Department of Health of the City of New York, with sixty-seven deaths. The average number of cases and deaths during the corresponding period of the five preceding years was 855 cases and sixty deaths.

Brooklyn M. E. Hospital Plans Maternity Hospital.—On December 15th, the thirty-third anniversary of the Methodist Episcopal Hospital, of Brooklyn, announcement was made that the establishment of a Maternity Hospital was being seriously considered by the board of managers, and that an anonymous gift of \$30,000 had been received to launch the enterprise, which it is estimated will cost \$200,000. No immediate action will be taken, but a committee of five has been appointed to study modern methods of construction and equipment of maternity hospitals.

St. Louis University Establishes a Department of Pharmacology.—Announcement has been made by the president of St. Louis University that Dr. John Auer, pharmacologist of the Rockefeller Institute of New York, has been secured to institute and conduct a department of pharmacology in the College of Medicine of the University. It is the hope of the faculty of the university to be able, through the Centennial Endowment Fund of \$3,000,000 now being raised by the friends and alumni of the institution, to establish complete departments in every line of medical instruction and research.

Vital Statistics in New York.—During the week ending December 11th there were 1,144 deaths from all causes reported to the Department of Health of the City of New York, corresponding to an annual death rate of 9.72 in a thousand of population, compared with a rate of 11.18 for the corresponding period in 1919. Of these deaths, 44 were due to acute infectious diseases, 86 to pulmonary tuberculosis, 9 to influenza, 64 to lobar pneumonia, 56 to bronchopneumonia, and 66 were violent deaths. The violent deaths do not include suicides, of which there were 18. The deaths under one year numbered 160; under five years, 221; between five and sixty-five, 659; sixty-five years and over, 264. The births during the week numbered 2,302; stillbirths, 123, and marriages, 1,368.

American Association for the Advancement of Science.—The seventy-third meeting of the American Association for the Advancement of Science will be held in Chicago, December 27th to January 1st, under the presidency of Dr. L. O. Howard, of Washington, D. C. The retiring president, Dr. Simon Flexner, of New York, will deliver an address on Twenty-five Years of Bacteriological Research.

Personal.—Dr. Edward A. Park, associate professor of pediatrics at Johns Hopkins University, has accepted the chair of pediatrics in the Yale Medical School.

Surgeon General Ireland, of the United States Army, has been awarded the silver medal of the Serbian Red Cross.

Dr. E. Ellis Owen has been appointed health officer of Louisville, Ky., to succeed Dr. Thomas H. Baker, deceased.

Rockefeller Foundation to Aid Medical Schools of Central Europe.—To assist medical schools in Central Europe, the Rockefeller Foundation announces a cooperative program covering the following points: 1. Aid in the rehabilitation of scientific equipment for medical teaching and research. 2. Aid in furnishing medical journals to universities throughout Europe. 3. An invitation to the authorities of Belgrade University Medical School to study medical education in America and England, as guests of the Foundation. Colonel F. F. Russell, who has been in Prague since August, serving as technical adviser in public health laboratory organization to the Czech Ministry of Hygiene, will arrange the details of the plan.

Brooklyn Cardiological Society.—The next meeting of the Brooklyn Cardiological Society will be held Monday evening, January 31st, at 8:30 o'clock, at the office of the president, Dr. William J. Cruikshank, 102 Fort Greene Place, Brooklyn. The paper of the evening will be read by Dr. Harold E. B. Pardee, of Manhattan, on the Field of Usefulness of Polygraph and Electrocardiograph Diagnosis of Cardiac Disease.

In a previous item concerning this society, published in our December 11th issue, page 954, the name of Dr. Richard C. Cabot, of Boston, was inadvertently omitted from the list of honorary members of this society, and through a typographical error the name of one of the speakers, the Rev. Dr. Kraeling, was spelled incorrectly.

Resolutions on the Death of Dr. Hyman Climenko.—Resolutions on the death of Dr. Hyman Climenko, which occurred in New York on December 16th, were adopted by the Neurological Staff of Mount Sinai Hospital, as follows:

WHEREAS, The untimely death of Dr. Hyman Climenko has deprived the Neurological Staff of Mount Sinai Hospital of a beloved colleague; and

WHEREAS, We, his associates, wish to recognize his great attainments as a true physician, his nobility of character, the simplicity of his life, his devotion to ethical conduct and his love of social justice; and

WHEREAS, We, his intimate friends, feel keenly the irreplaceable loss which his death has caused, therefore be it

Resolved, That we express our sympathy with his widow in her sorrow over the loss of so devoted a husband, and with the children who have been prematurely deprived of the tender guidance of their father.

Meetings of Local Medical Societies.—The following medical societies will meet in New York during the coming week:

TUESDAY, December 28th.—New York Academy of Medicine (Section in Obstetrics and Gynecology); New York Dermatological Society; New York Medical Union; Metropolitan Society of New York City (annual); New York Psychoanalytic Society; Riverside Practitioners' Society; Therapeutic Club; Valentine Mott Society; Washington Heights Medical Society; Woman's Hospital Society; Clinical Society of the Hospital and Dispensary for Deformities and Joint Diseases.

FRIDAY, December 31st.—Hospital Graduates' Club of Brooklyn.

Legal Status of the Public Health Service.—Surgeon General Hugh S. Cumming, of the United States Public Health Service, in his annual report, said that in his opinion it was of the utmost importance that the legal status of the Public Health Service in its war risk work should be firmly established by placing an administrative head over the three major agencies involved, namely, the War Risk Insurance Bureau, the Federal Board for Vocational Education, and the Public Health Service, and that these three bureaus should operate thereunder as coordinate and independent bureaus in close cooperation.

Died.

BACKMAN.—In Philadelphia, Pa., on Monday, December 6th, Dr. Edward F. Backman, aged sixty years.

BISHOP.—In Edensburg, Pa., on Saturday, November 27th, Dr. William T. Bishop, aged eighty years.

BROWN.—In Boston, Mass., on Thursday, December 9th, Dr. Louis Sumner Brown.

BUECHNER.—In Youngstown, Ohio, on Wednesday, December 15th, Dr. William H. Buechner, aged fifty-six years.

CLIMENKO.—In New York City, on Thursday, December 16th, Dr. Hyman Climenko, aged forty-five years.

CORNWELL.—In Buffalo, N. Y., on Saturday, November 27th, Dr. Benjamin W. Cornwell, aged fifty-eight years.

DAVIS.—In Ellicott City, Md., on Tuesday, December 14th, Dr. John W. Davis.

DOUGLASS.—In Philadelphia, Pa., on Tuesday, December 7th, Dr. John S. Douglass, of Cape May Court House, N. J., aged forty-five years.

KINSMAN.—In Saginaw, Mich., on Sunday, December 5th, Dr. Enos C. Kinsman, aged fifty-six years.

MARTIN.—In Baltimore, Md., on Wednesday, December 8th, Dr. Frank Martin, aged fifty-eight years.

MERRILL.—In Dozier, Ala., on Sunday, November 28th, Dr. J. P. Merrill, aged forty-six years.

MILLER.—In Somers, Mont., on Tuesday, November 30th, Dr. Charles E. Miller, aged seventy-seven years.

MILLETT.—In Belfast, Me., on Wednesday, November 16th, Dr. Adelbert Millett, aged sixty-two years.

PADIERA.—In Rochester, N. Y., on Thursday, December 2nd, Dr. G. W. Padiera, aged eighty-three years.

PHILIPS.—In Linesville, Pa., on Friday, December 3rd, Dr. David A. Philips, aged eighty years.

PLUMMER.—In Boston, Mass., on Thursday, December 2nd, Dr. Frank J. Plummer, of Malden, Mass., aged sixty-six years.

PYLES.—In Washington, D. C., on Sunday, December 5th, Dr. Richard Pyles, aged fifty-eight years.

SMITH.—In New York City, on Thursday, December 16th, Dr. Edwin Fayette Smith.

STEWART.—In Memphis, Tenn., on Monday, December 6th, Dr. C. M. Stewart, aged eighty-nine years.

WEED.—In Cleveland, Ohio, on Saturday, November 30th, Dr. Theodore A. Weed, aged sixty-four years.

WOEHNERT.—In Buffalo, N. Y., on Friday, December 10th, Dr. Albert E. Woehnert, aged fifty-two years.

Book Reviews

OCCUPATIONAL SKIN DISEASES.

Occupational Affections of the Skin. Their Prevention and Treatment. With an Account of the Trade Processes and Agents Which Give Rise to Them. By R. PROSSER WHITE, M.D., Ed., M.R.C.S., Lond. Life Vice-President, Dermatologist, Senior Physician and Ethetic Officer, Royal Edward Infirmary, Wigan; Vice-President Association Factory Surgeons, etc. Second Edition. With Twenty-four Plates (Comprising Twenty-eight Figures). New York: Paul B. Hoeber, 1920. Pp. xiv-360.

There was a tremendous outcry during the war whenever it was found that the men were running some unnecessary risk or living under bad, preventable circumstances, the outcry promptly bringing about a change, particularly when human lives became costly and scarce.

And that many millioned army which each morning sets forth in the dawning! It must gain a livelihood for itself, also comfort and luxury for non-combatants. It has to face, and is facing, hundreds of foes, silent, hidden, unsuspected, lurking even in flowers and trees, attendant on every new invention, every discovery, from a new dye for a lady's scarf to the potent, little known radium.

So great the risks, so woeful their wreckage, that scientists for philanthropy's sake, and trade economists for very shame, have set to work and found many evils preventable and all amenable to early treatment. Everyone should read the results, for, in reading, they would shoulder the responsibility of knowledge and, if honest, would not enjoy their food, clothes, books, carriages, and luxuries until the preventable had become prevented.

Mere reading of the index of this book will rouse one to activity. Foes there are to electric workers, to the washer woman, the fish packer, the photographer, the spinner, the dyer, the woodworker, the tanner, the chemist, the farmer, and danger is not over when the various things pass from gross manufacture to individual workers using additional things in finishing. Dermatitis venenata—what is that? The chapters so headed describe the skin diseases which may arise from some plant, dye or drug with which the worker comes in contact. The lacquer tree of Japan (*Rhus vernicifera*) is a bad enemy, so is the tomato and the beautiful *primula obconica*, which affects the skin of those who gather it for florists. Gardeners also suffer from handling the Virginia creeper, which causes great skin irritation, and the *Vanilla plantifolia*, so much used in flavoring, is a source of skin disease to the cleansers and packers of the pods, and to those who put up the packets of powder. Even the aircraft factory has revealed two enemies. The splinters of the silver spruce are one, producing small, gradually enlarging blebs, and the Indian satinwood, even in the transporting, gives rise to a kind of erysipelas among the dockers.

Most people have heard of the dangers which skin dressers and those who work on wool and hair are liable; butchers also contract an acute febrile pemphigus through handling diseased animal tissues, which often ends fatally. Then, too, the streptococcus is lurking in the sausage skins which employment of cleansing is generally done by

women. From tree top to ocean depths dangers lurk. A parasite of the sponge, much dreaded by divers, is the *Sargasia rosea*. Blisters form all over the part stung; multiple abscesses and skin sloughing follows.

Not only workers, as generally understood, are in danger. There is the *Verruca necrogenica*, or anatomical tubercle, found most frequently in the human cadaver, which attacks doctors, veterinarians, bacteriologists, postmortem attendants, nurses, and undertakers.

The list of enemies is enough to scare any fighter, yet, curiously, until recently the workers regarded them as a necessary accompaniment and, disabled, received no compensation. The great difficulty now is to make employers fully alive to the crime of nonprevention and the employees to the necessity of it. Rich women who wept as the troops marched warwards cannot yet pocket their handkerchiefs if their sorrow was sincere, for every morning the great army of toil stained, toil stunted, patient people go marching out to meet invisible foes, and women's tears and women's protests would speedily stay the hardships and force Dr. Prosser White to bring out a third edition to report jubilant victories.

PHYSICAL CULTURE.

Massage and Exercises Combined. A Permanent Physical Culture Course for Men, Women, and Children. Health Giving, Vitalizing, Prophylactic, Beautifying. A New System of the Characteristic Essentials of Gymnastic and Indian Yogis Concentration Exercises Combined with Scientific Massage Movements. With Eighty-six Illustrations and Deep Breathing Exercises. By ALBRECHT JENSEN, Formerly in Charge of Medical Massage Clinics at Polyclinic Hospital and Other Hospitals, New York. New York: Published by the Author, 1920. Pp. xiii-93.

Many writers on nervous diseases are averse to massage for some patients because they are already selfconcentrated and lazy, and massage, being an exterior aid, makes no demands on the patient in the way of exertion. Many hysterics will have a thorough course of treatment and, though acknowledging an improvement to themselves, will tell others it hasn't helped them much as it was not suited to their particular malady. Such are really not worth the trouble of massaging, but if they can be coaxed or compelled to do the exercises themselves the feeling of dependence is removed and introduces other good habits, useful to the patient, and a blessing to the tired family. The great thing with all patients is to induce them to persevere when the novelty is over. Who does not know the dusty chart of exercises nailed up in the bathroom, now hardly looked at, or the book with curled corners and full of passages scored approbatively with whose contents we bored our friends until we ourselves were bored and the book became hidden under piles of others. The exercises detailed in this book are easy to follow because shown in good illustrations. The chapter on special and general deep breathing exercises gives easily followed directions. How faulty our breathing we disrealize until we try to do it properly. When the Maori football team came over to play against England,

the English were easily beaten. Asking a Maori how this came about, he said: "You English, no air inside; we breathe all over from mouth to toes." That was at a time when soldiers were thought beautiful when the chest protruded and was rigid, the shoulders well set back. Whereas the natural, healthy man has his chest walls relaxed, his shoulders fall comfortably, yet he does not stoop. The humped up shoulder is indicative of faulty breathing, of tension, of selfconsciousness.

Eastern cities abound with masseurs, but they live in bathing places, not in parlors; they are stalwart negroes who, after the steam bath, seize you and pound you and knuckelize you with strong oils until you expect to be carried away defunct; instead, you are lithe and happy and long for the next time. This book of selfmassage will keep many from the foolish ladies and inept men who open massage establishments without any knowledge of anatomy and less of disease. It will give a pleasant feeling of cooperation even when the massage is not selfdone; diseased conditions are improved, even chronic ones.

EVOLUTION OF THE DRAGON.

The Evolution of the Dragon. By G. ELLIOT SMITH, M.A., M.D., F.R.S. Illustrated. London, New York, Chicago, Bombay, Calcutta, Madras: Longmans, Green and Company, 1919. Pp. xx-234.

The writer of this book is hardly just to its value. He designates it as "little more than a collection of data and tags of comment." One feels this in certain places and accepts the author's apology for it. In much of the book any such criticism is forgotten in interest in its vivid facts. The data it presents have this vividness, for they are the strange facts not of material reality but the products of man's fertile ability for phantasy creation. They are vivid also with Smith's own interest in searching them out and presenting them. Even more are they alive with the keen interpretation with which he views them as expressions of man's basic strivings.

He has been fearless in carrying them back to an expression of the ever active reproductive need. This has always sought varying expression. So there are ample discussions of some of these large features which form great psychic way stations where desires stop, start out again, and again return. The study of the Great Mother, typified in Aphrodite but symbolized over and over again, in part and in whole, is one of these. The Dragon is a picture of the same and of more besides. One could ask for an even deeper penetration of the symbolism, a profounder comprehension of the striving dreams of man.

Then we are confronted with the again raised question of spontaneous arising of all this symbolic matter in different parts of the world, or its diffusion from one cradled origin would fade into insignificance. Migrations preserve and carry forward the past, but everywhere this past meets fertile growths like itself and is reimpregnated by them. Together they form new products, the origins of which can as little exclude one another as either parent can with egotism exclusively assume the production of a child.

MEDICAL LECTURES TO NURSES.

A Course of Lectures on Medicine to Nurses. By HERBERT E. CURFF, M.D., F.R.C.S., Principal Medical Officer to the Metropolitan Asylums Board; Late Medical Superintendent, North Eastern Fever Hospital, Tottenham, London. Seventh Edition. With Twenty-nine Illustrations. Philadelphia: P. Blakiston's Son & Co., 1920. Pp. vii-257.

The tired nurse with ragged nerves and aching feet does not always respond cheerfully to the invitation to improve her mind, but there are some, wearied with routine and hard work, who will resolve to make themselves fit for something better, out of pure desperation. When the lectures are given by a man interested in the nursing world and is a clear expositor, he rarely lacks an audience. To fortify the little knowledge possessed by the nurse of anatomy and pathology, and to prevent discouragement, the author has fully explained enough to launch her safely on the sea of medical knowledge. The fact that a seventh edition has been called for is sufficient recommendation of the teacher. In it a lecture on pulmonary tuberculosis and sanatoria treatment has been added. He deals with many forms of disease not usually given in nursing manuals, having noted the anxiety of the nurse to understand what he is saying to students in his clinical rounds, and knows she often falls into despair when trying to find out for herself in textbooks. The chapter on Children's Diseases is good, as these inarticulate patients who cannot explain their pain often sorely puzzle the nurse. Hemorrhage, too, especially when internal, often makes for alarm. The book is small and pocketable. We are safe in predicting an eighth edition.

A MEDIEVAL ROMANCE.

The Revels of Orsera. A Medieval Romance. By RONALD ROSS. New York: E. P. Dutton & Co., 1920. Pp. vi-393.

With one or two exceptions, doctors as story writers are as big a failure as a layman attempting a surgical treatise. They are so accustomed to condensation in case writing that they cannot put in enough frills and thrills and scenery to expand and beautify stern facts. Their characters are often only animated megaphones. It was therefore with a melancholy sniffiness that the reviewer took up this book, only consoled by the fact that a Scotsman might be dry but would never be foolish. Hope is realized. Curiosity is awakened as the reader travels back to the Swiss mountains in 1495 and encounters Morova Neroni and her deformed son, Zozimo, with his twin sister, the marvelously beautiful Astrella. She, with Count Reichenfel's daughter, Lelita, move the hearts of and influence the Prince of Astra, Trullo, the Count's nephew, Bran, his captain of arms, a crowd of knights, guards, priests, a deformed jester, and a witch. There is an uneasy mystery hanging heavily on the story, for there is a Voice, the supernatural Astrella, the rapidly appearing and disappearing Count Azrimar, who becomes the chosen suitor for Lelita, he winning her by adventure in joust and tourney, and recovering after blows so hard that the author must be supposed to have been attacked by the dime novel germ at an early age, for his career as a doctor could hardly have included such cases.

Irrespective of the fine storm drenched pictures of the mountains, there are good descriptions of the emotions. One is on the weapon of silence, where the witch, Brunde, is being tried:

"What is your name?" thundered the Cardinal again.

"Brunde's eyes remained fixed on vacancy. Only retort of the wretched against the world arrayed in judgment before them—silence! 'What is your condition?'—rags. 'What is your crime?'—misery. 'What is your name?'—no answer.

"The world rises, puts both his fists on the table, and shouts at her. Or he flings himself backward, smiles deprecatingly, and loosens his waistcoat buttons, or his doublet or his tunic, as the case may be. The law, in the shape of policeman, halberdier, or beadle, looks ferociously at her, squints down his red nose or shakes her arm. No answer. The whole court is insulted. The judges turn round their heads like parroquets and look at each other, while their tongues click in their mouths with amazement. Are we, God's vicegerents of justice, to be insulted by you, God forgotten? They leap up and roar at her, they smile at the ceiling, scratching their chins with their pens; they grow apoplectically crimson; they nod their heads gravely seven times; they lift their hands and call Heaven to witness. 'What is your name?'—no answer."

The Revels were begun thirty years ago. In them the author has "tried to analyze character into its constituent elements and to set forth each element by itself in apposition."

But, with the author's permission, we will not try to find his second meaning. Let it be strong enough to strike us or it shall go unheeded. The book is one of great interest right away to the end. Why does he require wearied men, armed only with papercutters, to halt during the reading and dig for his hidden meanings? The story shall be enjoyed for its own sake first, and readers can wait for the solution until some learned psychologist finds out exactly what the author meant and tells us.

SATAN'S DIARY.

Satan's Diary. By LEONID ANDREYEV. Authorized Translation Never Before Published in Any Language. With a Preface by Herman Bernstein. New York: Boni and Liveright, 1920. Pp. xvii-263.

In reading *Satan's Diary* one is strongly tempted to contrast it with some of Andreyev's earlier works—his realistic *Red Laugh*, for instance, one of the most powerful stories that has ever been written on war, or *The Black Maskers*, a play rich in its wealth of symbolisms. But here we have the man in another mood, no longer the weaver of mystic drama, no longer the bold propagandist, flinging aside the curtain on abominable scenes he wished to have abolished from the history of man. He has attempted to combine realism and fantasy, the conflict of Wondergood, American millionaire, and Satan. The workmanship is crude, the fusion has been incomplete, and the result is far from convincing, as a work of art. He has attempted what, under ordinary circumstances, would have turned out a masterly thing from the pen of Andreyev—something akin to his *Judas*—which was a finished

piece of work. Can it be that he was fatigued or that he was unable to polish the product as he would have liked to? Can it be that the bleak Finnish wastes only reflected the barren phases of the Russian upheaval? These questions are difficult to answer. At any rate, admirers of Andreyev will read this, his last book, and wonder where the skill and warmth of the old Andreyev have vanished; they will read and compare the old Andreyev with the new, and they will feel that the new Andreyev had grown old too soon.

MOONS AND MISSIONARIES.

The Crescent Moon. By F. BRETT YOUNG. Third Edition. New York: E. P. Dutton & Co., 1920. Pp. 284.

Africa has meant many things to many men. To Francis Brett Young, author of *The Young Physician*, it is "the land above all others which men of European race have never conquered," a land of lush beauty, of mystery and of a sinister horror, a land where the clerical virtues of the Anglo-Saxon go down to defeat before the untamed things in the swamps. *The Crescent Moon* has all these qualities. It recreates with unflinching fidelity the terror and unwilling fascination with which an unsophisticated English girl finds herself for the first time thrown face to face with the primitive things of the forest. More than that, it is a pitying and ironic study of that temperament which, essentially artistic, expresses itself in religion through the pressure of generations of puritanism and ignorance.

As an adventure story *The Crescent Moon* can give points to many of the current mystery tales. It details the life of Eva Burwarton, a girl from a tiny, shut in English town, who, on the death of her father, goes to Africa with her brother, a young missionary. Their mission is situated on a hillside above the "dark forest" wherein seethes the life, human and subhuman, which is so far outside of their limited experience. James, the evangelical brother, is thus epitomized:

"I suppose in the class from which he came there are any number of young men of this kind, born mystics with a thirst for beauty which might be slaked in any glorious way, yet finds its satisfaction in the only revelation that comes their way in a religion from which even the Reformation has not banished all beauty whatsoever. They find what they seek in religion, in music (such music! . . . but I suppose it's better than nothing), in the ardours of lovemaking; and they go out, the poor, uncultured children that they are, into the 'foreign mission field,' and for sheer want of education and breadth of outlook die there . . . the most glorious, the most pitiful of failures. That, I suppose, is where Christianity comes in. They don't mind being the failures that they are. Oh, yes, James was sufficiently consistent. . . ."

By contrast with their only neighbor, Godovius, a German Jew with a smattering of culture and a whip hand over the ladies, James is sufficiently inadequate, and all through Eva's struggle against the power of Godovius he grows more so. He is consistently drawn. "To him religion was such a simple thing." And in the uprising, fomented by Godovius

and suddenly grown beyond his control, he dies, pitifully and consistently.

It is James's inadequacy that nourishes the friendship between Eva and Hare, the keen and self-reliant refugee whom she finds in the forest one night with a broken arm. Hare is everything that James is not, and the two of them, he and Eva, are drawn together as the web of hostile circumstance tightens about James. The ending to this story, too, is inevitable.

This book should appeal to a divergent public—probably has so appealed since this is the third edition. It contains thrills, color, and an unexpected irony. Above all, it is Africa as seen through several differing temperaments.

ANATOLE FRANCE.

The Bride of Corinth and Other Poems and Plays. By ANATOLE FRANCE. A Translation by WILFRED JACKSON and EMILIE JACKSON. London and New York: John Lane Company, 1920. Pp. xv-285.

The Seven Wives of Bluebeard and Other Marvelous Tales. By ANATOLE FRANCE. A Translation by D. B. STEWART. London and New York: John Lane Company, 1920. Pp. vi-216.

In *The Bride of Corinth* we find France at work on the conflicts which touched him the most deeply. Here we find him contending with restraint in the portrayal of an old struggle, the soul and the heart of woman, and the bivalent pull that is exerted, the old fixations on home and mother, and again expressed by church and a complete heterosexual creative call; neither of these is answered and it is only by the skill of France that the dominant note is not one of black despair. In the end, neither object is attained and we witness the emotional distress which is not allowed to become too profound. The story is worth reading, if only for the skill with which it has been handled.

In the same volume we find *Crainquebille* and *The Man Who Married a Dumb Wife* in addition to a third play. The first two plays have been presented and well appreciated in America, the first in French and the second a satirical farce in English. Crainquebille portrays failure through weakness; weakness on the part of a sympathetic old character and the weakness of a social order which reflects an all too frequent condition in many countries and during many crises. The reactions he shows of the small social group could well be applied to the majority of the hysterical French press of today. Anatole France has made Crainquebille a national character in France. He was aided in this by the masterly interpretation of the character by Lucien Guitry, to whom he has inscribed the play.

* * *

In *The Seven Wives of Bluebeard* we find France in his most clever mood. In this group of charming stories he shows the errors of history and how famous characters, Macbeth, Bluebeard, Jean d'Arc, and many others have been grossly maligned. He attributes these misconceptions to the inaccuracy of various writers and historians. He thinks it just as well that we have his interpretation of these various characters, and it must be acknowledged that his is the more human concept of the lives and doings of these people. If France had the time he

would rewrite all history, mythology, and folklore, and give us a new history, mythology, and folklore, not more nearly accurate but more as he would like to have it, and it seems fairly certain we would appreciate his concepts more than the older ones. His myths are more plausible and less monotonous, for it must be admitted that he has great versatility. These stories should furnish deep pleasure to his readers.

New Publications Received.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

POTTERISM. By ROSE MACAULAY. New York: Boni and Liveright, 1920. Pp. x-227.

REPPRESSED EMOTIONS. By ISADOR H. CORIAT, M.D., New York: Brentano's, 1920. Pp. 213.

WHAT I SAW IN RUSSIA. By GEORGE LANSBURY. New York: Boni and Liveright, 1920. Pp. 172.

THE "WELCOME" PHOTOGRAPHIC EXPOSURE RECORD AND DIARY. London: Burroughs Wellcome & Co., 1921. Pp. 260.

THE NEW DECAMERON. Volume the Second, Containing the Second Day. New York: Robert M. McBride & Co., 1920. Pp. vi-183.

THE SECRET CORPS. A Tale of Intelligence on All Fronts. By CAPTAIN FERDINAND TUOHY. New York: Thomas Seltzer, 1920. Pp. 289.

ELFTES HEFT. Krankheiten des Rückenmarks und der peripherischen Nerven. Von Professor Dr. R. CASSIRER in Berlin. Mit 1 Abbildung. Leipzig: Verlag von Georg Thieme, 1920. Sehntes Helf, Seiten 72. Elftes Heft, Seiten 157.

DIAGNOSTISCHE UND THERAPEUTISCHE IRRTÜMER UND DEREN VERHÜTUNG. Innere Medizin. Herausgegeben von Prof. Dr. J. SCHWALBE, Geh. San.-Rat in Berlin. Zehntes Heft. Krankheiten des Blutes und der Drüsen mit innerer Sekretion. Von Prof. Dr. O. NAEGELI, Direktor der Medizinischen Poliklinik in Zürich. Mit 4 Abbildungen.

DIAGNOSTISCHE UND THERAPEUTISCHE IRRTÜMER UND DEREN VERHÜTUNG. Chirurgie. Herausgegeben von Prof. Dr. J. SCHWALBE, Geh. San.-Rat in Berlin. Erstes Heft. Chirurgie des Thorax und der Brustdrüse. Von Geh. Med.-Rat Prof. Dr. G. LEDDERHOSE in München. Mit 8 Abbildungen. Leipzig: Verlag von Georg Thieme, 1920. Seiten iv-123.

LABORATORY MANUAL OF THE TECHNIC OF BASAL METABOLIC RATE DETERMINATIONS. By WALTER M. BOOTHBY, A. M., M. D. and IRENE SANDIFORD, Ph.D., Section on Clinical Metabolism, the Mayo Clinic, Rochester, Minnesota, and the Mayo Foundation, University of Minnesota. Illustrated. Philadelphia and London: W. B. Saunders Company, 1920. Pp. 117.

CHEMICAL PATHOLOGY. Being a Discussion of General Pathology from the Standpoint of the Chemical Processes Involved. By H. GIDEON WELLS, Ph.D., M.D. Professor of Pathology in the University of Chicago and in Rush Medical College, Chicago; Director of the Otho S. A. Sprague Memorial Institute. Fourth Edition, Revised and Reset. Philadelphia and London: W. B. Saunders Company, 1920. Pp. 695.

PRACTICAL PREVENTIVE MEDICINE. By MARK F. BOYD, M. D., M. S., C. P. H., Professor of Bacteriology and Preventive Medicine in the Medical Department of the University of Texas; Passed Assistant Surgeon (Reserve), U. S. Public Health Service; Formerly Epidemiologist of the Iowa State Board of Health and Associate Professor of Preventive Medicine in the College of Medicine of the University of Iowa, etc. With 135 Illustrations. Philadelphia and London: W. B. Saunders Company, 1920. Pp. 352.

Practical Therapeutics and Preventive Medicine

A Compendium of Treatment and Prophylaxis, Original and Adapted

Childhood the Period for Mental Hygiene.—William A. White (*Mental Hygiene*, April 1920) says that one of the most important issues in mental hygiene is to correlate the sick adult with the knowledge we have that his illness is traceable in its beginnings to his early life. This must be done by a more developed knowledge of the psychology of childhood, which is reflected in the home, in the school, and in the principles and methods of education. Efforts to improve the environment, even with reference to such obvious features as food, clothes, and ordinary sanitation, are not lacking in their general effect upon the mind of the developing child. Recent observations in the devastated countries of Europe have shown how quickly destitution, which takes all the joy out of life, is reflected in the mental makeup of the children. Such problems as the care of the pregnant woman, child labor, sex education, school sanitation, and more specifically the problems of the atypical child and juvenile delinquency, all can be better dealt with in proportion to our increased knowledge of child psychology. Social problems have a direct bearing. Inasmuch as many of the breaks, perhaps most of them, occur in the adolescent or early adult period, it would be of inestimable value if help could be systematically extended to the youth when the symptoms of final disaster are likely to be discoverable.

Malignant Tumors in Childhood.—Malvern B. Clopton (*Journal of the Missouri State Medical Association*, September, 1920) writes that malignant tumors in children are far from rare, and sarcoma is the type of growth almost always encountered in childhood, just as epithelial cancer is the common type in old age. Sarcoma in children often follows a more rapid course than in adult life, and the most malignant growths are those which appear earliest in life, some of these possibly being congenital. Often there is no change from normal good nourishment of the child until metastasis occurs, when the downward course is most rapid. Febrile reaction may mislead the observer into thinking that the mass is due to an infection. No organ is exempt from these new growths, but it is generally considered that the kidney is the seat of sarcoma more often than any other organ. Two types of eye tumors occur in childhood: sarcoma of the iris or choroid, and glioma of the retina. Brain and spinal tumors are not uncommon, the greatest mortality being in gliomata. Sarcoma or mixed celled growths of the testicle are not common, and a few cases are found in the literature of carcinoma and sarcoma of the ovaries. Carcinoma of the small intestine is practically never found in children; when sarcoma occurs it is in the small intestine. Sarcoma of the long bones occurs rather infrequently in childhood. As to treatment, early operation offers the best chance for recovery, but Clopton is convinced that Coley's toxin should be used in these cases with

great thoroughness. He does not agree that all giant celled growths should have the toxin, because they are benign and should be eradicated if possible; but all other growths, whether operated upon or not, should get the injections and have the benefit of the röntgen ray in massive doses, or be treated with radium.

Differential Diagnosis of Diseases of the Hip Joint in Children.—Arthur T. Legg (*Boston Medical and Surgical Journal*, June 10, 1920) says that at times it is a matter of great difficulty to differentiate between the tuberculous and the non-tuberculous infection of this joint, and impossible until the case has been thoroughly studied. A most careful history should be obtained. A most complete physical examination should be made. A röntgenogram should be taken in every case of suspected bone or joint disease; and every laboratory method at our disposal should be used before making a positive diagnosis.

Complications of Bacillary Dysentery.—P. Manson-Bahr (*British Medical Journal*, June 12, 1920) describes an arthritis which occurs in the course of bacillary dysentery. It was noted twice in cases not treated with serum, but in the majority of cases it appeared subsequent to the injection of serum. There were two types of arthritis observed. The first was a transient polyarthritis appearing on the seventh to the twelfth day after serum injection and ushered in by symptoms of serum sickness. The second type was a prolonged, intractable form accompanied by a sudden effusion into the joint cavity but without signs of local inflammation, such as redness and heat. Of twenty-nine cases treated with serum, the transient type developed in eleven, and in eight the intractable type developed, while in three hundred and thirty-five cases, convalescent or light, not treated with serum, arthritis developed in only one.

Bacillary Dysentery in Children.—Wilburt C. Davison (*Bulletin of the Johns Hopkins Hospital*, July, 1920) used as the basis for this study 134 cases of diarrhea, seventy-one of which were diagnosed clinically as dysentery. More than eighty per cent. of the acute cases if ileocolitis were due to infection with *Bacillus dysenteriae*. In a control series of sixty-three cases of simple diarrhea and one hundred normal children *Bacillus dysenteriae* was not recovered from the stools in any instance. Dysentery was less prevalent among children receiving breast milk or boiled milk and boiled milk mixtures in boiled containers. Assistance in the diagnosis of dysentery can be gained by the agglutination reactions of the patient's serum by standardized technic. *Bacillus morgan* No. 1, *Bacillus welchii*, *Bacillus pyocyaneus*, *Bacillus proteus*, and the *Streptococcus fecalis* are not the cause of dysentery (ileocolitis) or diarrhea. Davison suggests that the name ileocolitis should be changed to dysentery in children and the disease made reportable to the health authorities.

Modification of the Action of Adrenalin by Chloroform.—W. J. R. Heinekamp (*Journal of Pharmacology and Experimental Therapeutics*, November, 1920) describes experiments proving the fact that chloroform is toxic for heart muscle, producing or tending to produce weakening of the organ. Inhibition under chloroform anesthesia after administration of adrenalin is due primarily to the toxic or paralytic dilatation of the heart, ventricular fibrillation supervening. Because of the action of chloroform on the heart, adrenalin is contraindicated wherever chloroform is employed and chloroform wherever adrenalin is used. The blood pressure has no definite reflex relation to the production of the condition of paralytic dilatation, but has a most important direct action by preventing the ventricle from emptying itself. The adrenalin action is peripheral, since it occurs after section of the vagi.

Diagnostic Signs in Tracheobronchial Adenopathy.—García Trivino (*La Medicina Ibero*, March 20, 1920) notes that the tracheobronchial glands are divided into two groups. The first or pretracheobronchial group lies in two parts alongside the trachea and in the superior angle formed by the trachea and the large bronchi. The second or intertracheobronchial group lies in the inferior angle formed by the bifurcation of the trachea. Clinical physical signs of enlargement of these glands are Smith's sign or venous hum over the manubrium of the sternum with the head in forced extension; D'Espine's sign of bronchophony or pectoriloquy below the level of the seventh cervical vertebra; Hochsinger's sign of glandular enlargement in the fourth and fifth intercostal spaces in the median axillary line. This condition of enlargement of the bronchial glands is much more common in children than in adults, and it predisposes to the invasion of the tubercle bacillus although the primary infection may be due to grippe, whooping cough, measles, or syphilis. In a final analysis a radiograph will either prove or disprove the existence of the glandular enlargement.

Tuberculous Myocarditis.—E. Lenoble (*Bulletin de l'Académie de médecine*, October 19, 1920) states that various arrhythmias may be met with in chronic or acute pulmonary tuberculosis. He has personally witnessed one case of sinus arrhythmia with alternating pulse; six cases of auricular fibrillation; two of nodal rhythm; three of premature beats; one of paroxysmal tachycardia with alternating pulse; one of prolongation of the *a-v* interval with alternation of the jugular pulse, and one showing secondary waves during the *a-v* interval. Fluoroscopic studies showed the heart to be sometimes small, as in the average case of tuberculosis; generally, however, it was enlarged as a whole or in one of its parts. The blood pressure ranged from seventy to 190 millimetres of mercury. The prognosis is unfavorable in these cases because the heart disturbances are an expression of a deep seated pathological change in the myocardium, superadded upon the tuberculous disease involving other organs. The existence of paroxysmal tachycardia or of nodal rhythm is particularly ominous. The diagnosis is based partly on the absence of a history

of rheumatism or other major infections. Out of fourteen cases in which a Wassermann test was made, the author obtained only one positive result. The gross pathology of the heart was rather variable, but microscopic study sometimes yielded rather striking changes. Actual angiomas were found at the junction of the superior vena cava with the auricular muscle tissue. Other conditions noted included fibrosis and lime infiltration about the bundle of His; perifascicular fibrous deposition, and changes in the vessel walls. In one of the cases of nodal rhythm the node of Keith and Flack was infiltrated with small primitive connective tissue cells compressing the muscle fibres. In the other case there was in addition thrombosis of the pectineal tissues. Out of nine guineapig inoculations, two were positive. The author recognizes not only an active type of heart muscle disease in tuberculosis, viz., bacillary myocarditis, but also a type attended with cicatricial deposits due to healed tuberculosis, such deposits being responsible for the arrhythmias observed. The connective tissue deposits, as in the case of the kidneys, need not necessarily contain tubercle bacilli. These deposits are due to the sclerosing toxins of the tubercle bacillus.

Determination of the Need of Surgery in Peptic Ulcer.—W. A. Bastedo (*American Journal of the Medical Sciences*, October, 1920) maintains that surgery in a case of peptic ulcer must not be resorted to too lightly. He considers surgery imperative and medical treatment futile in the following conditions: 1, Chronic penetration as shown by radiographs; 2, palpable induration; 3, adhesions which cause distortion of the stomach, interference with peristalsis, or much pain during the digestive period; 4, permanent hourglass; 5, pyloric stenosis not syphilitic; 6, repeated copious hemorrhages; 7, conditions which suggest that an ulcer is becoming carcinomatous. The majority of peptic ulcers can, in his opinion, be definitely said to require surgery only after the failure of thorough and prolonged medical treatment. When the case is medical, the relief of symptoms (not the cure) by treatment is, as a rule, quite prompt. Therefore, on the one hand, the failure of the treatment to relieve the symptoms suggests that the case is probably surgical; whereas, on the other hand, when a case seems in all likelihood surgical, but not certainly so, a course of medical treatment is advisable to prove the point. Furthermore, if the patient shows a positive Wassermann reaction or gives a history or any physical evidence of syphilis, antiluetic treatment should be tried. Given a thorough medical trial by someone competent to supervise the treatment, we should consider those cases surgical which continue to show: 1, persistent or recurrent hemorrhage even small in amount; 2, pain; 3, nausea; 4, pylorospasm of such persistence as to simulate pyloric stenosis; 5, inability to ingest comfortably the ordinary wholesome foods permitted by the circumstances of the patient, this making the poor patient a surgical case earlier than one who is well to do; 6, inability to ingest comfortably enough food to maintain nutrition while living a normally occupied life; 7, recurrence after apparently a cure.

Dry, Wet, and Ointment Dressings for Wounds.—Charles T. Souther (*Ohio State Medical Journal*, May, 1920) advises the use of dry gauze dressings in clean surgical cases. They may be used in cases in which suppuration is already established, especially when the wound is united or connected with a serous lined cavity. When mucous lined cavities are involved some form of ointment dressing is to be preferred. Wet dressings are indicated in the presence of cellulitis or when there is much edema in and about the wound. The use of Dakin's solution should be limited to the wound area and not come in contact with the skin. Wet dressings are contraindicated in outpatient clinical work in cold weather because of the danger of freezing. Bichloride does harm in solutions stronger than one in 10,000. Carbolic acid is extremely dangerous, even in weak solutions. Ointment dressings are of great value because they facilitate drainage, protect the surrounding skin from eczema, prevent albuminous exudate from getting dry and sealing a wound, and prevent infectious material from being absorbed. There is no pain on changing ointment dressings, nor any pull on the stitches. Epithelium grows faster under an ointment dressing. Ointment dressings need not be changed as frequently. Ointments with a mineral fat base are preferable.

Experimental Studies on Effects of Carbohydrate Diets in Diabetes.—Frederick M. Allen (*Journal of Experimental Medicine*, April, 1920) reports that the injurious effects of excessive carbohydrate feeding are demonstrable in partially depancreatized dogs in the same manner as in human patients, and that when a severe diabetes is produced there is a consequent rapid progress of emaciation, weakness, and early death of the animal. When a milder degree of diabetes is produced, the result after the operation frequently depends on the diet, so that if the tolerance is spared for a time recovery may occur to such a degree that it is impossible to produce diabetes by any kind or quantity of feeding, but a second operation, removing a small additional fragment of the pancreatic tissue is necessary. In this early period it is very important to give the proper degree of carbohydrate over-feeding in order to produce the most useful type of diabetic animals, that is, those with good digestion and general health, and with a permanent lowering of assimilative power comparable to the condition of the human diabetic. In the early part of the disease glucose was more powerful in producing glycosuria than starch. Admixtures of glucose given to an animal progressing toward complete recovery on a starch diet were capable of producing a helpless diabetes. This is accounted for by a difference in the rate of absorption, showing that a rapid flood of carbohydrate is more injurious to the pancreatic function than a slow absorption. But when a permanent diabetes is established, with no hope of recovery, starch brings on a glycosuria just as surely as sugar, if more slowly. From such experimental evidence the clinical deduction is drawn that even if a patient becomes free from glycosuria on withdrawal of sugar only, other foods should also be restricted. Experiments on com-

parisons of starches showed no significant difference in their assimilation, nor was there any extreme lowering of the carbohydrate tolerance by proteins, such as has been claimed by some authors in connection with the "oatmeal cure." As the basis for the early tendency to recovery, Allen mentions repair of traumatic inflammation and hypertrophy of the pancreas remnant, and as an accompaniment of the lowering of tolerance by excessive diet, hydropic degeneration of the islands of Langerhans.

A Simple Means of Obviating Anaphylactic Shock.—A. Lumière and J. Chevrotier (*Presse médicale*, November 6, 1920) report experimental work indicating that anaphylactic manifestations are due to the formation in the blood plasma, at the time of the second injection, of a colloidal flocculent precipitate which causes asphyxia by obstructing the capillaries. Seeking to find substances which might prevent such precipitation, they ascertained that among the few compounds effectual in this direction sodium hyposulphite was by far the least toxic. Addition of a considerable proportion of this salt to the animal serum constituting the second injection of protein was observed in experiments to prevent anaphylactic shock, to which, on the other hand, the control animals, unprotected by the salt, invariably succumbed. Similar experiments with antidiphtheritic serum gave the same results. The authors deem addition of sodium hyposulphite in suitable amount to therapeutic serums a simple, practical, and harmless means of obviating anaphylactic manifestations in clinical work.

Aftertreatment in Surgical Cases.—D'Arcy Power (*Practitioner*, July, 1920) gives the following suggestions concerning postanesthetic vomiting: The smell and the vomiting both have to be combated after ether and chloroform anesthesia. The smell of ether can be lessened by equal parts of eau-de-Cologne and water, used on a handkerchief, or sprinkled on the beard or mustache. The taste can be reduced by ordering a mouth wash of carbonate of soda (phenol, eight; caustic soda, three and one half; distilled water, one hundred), diluted ten or twenty times; or by phenol, six grains; citric acid, five grains to an ounce of Cologne water diluted to two ounces with warm water. The degree of vomiting varies with the length of the operation, the previous preparation of the patient, and with his individuality. It is most severe after the removal of enlarged cervical glands. When vomiting is not very severe, sips of hot water may be given. In more persistent cases fifteen grains of bicarbonate of soda may be dissolved in a tumblerful of hot water; the patient vomits it directly, but the sickness afterwards subsides. In very severe cases give nothing by mouth, but administer a sedative enema, consisting of bromide of potassium and chloral hydrate, each twenty grains, and mucilage of starch, two ounces. The author has never had to wash the stomach out to stop the vomiting. When vomiting has been unduly prolonged it is sometimes a good plan to feed the patient solid food rather than to restrict him to slops.

Proceedings of National and Local Societies

AMERICAN PEDIATRIC SOCIETY.

Thirty-second Annual Meeting, Held in Highland Park, Ill., May 31, June 1 and 2, 1920.

The President, Dr. THOMAS S. SOUTHWORTH, of New York, in the Chair.

(Continued from page 1008.)

The Ulcerated Meatus in the Circumcised Child.—Dr. JOSEPH BRENNEMAN, of Chicago, stated that ulceration of the meatus was very common in circumcised children. There was usually ulceration, scab formation, narrowing of the meatus, painful urination, often partial obstruction, and occasionally hemorrhage at the end of urination. The condition seemed always associated with what was known as the ammoniacal diaper, and apparently resulted from direct contact of the meatus with the wet diaper. The treatment consisted in applying vaseline or wet boric acid dressings to the meatus if inflamed and in the prophylaxis of the ammoniacal diaper. The latter was probably due to a metabolic disturbance that was not yet fully understood, but probably commonly due to over-feeding with cows' milk fat, as a result of which there was an excessive excretion of ammonium salts in the urine. Inasmuch as the ammonium salts must be broken down to liberate ammonia, and this was commonly effected by an alkali, it was well in addition to reducing the ammonium content of the urine to rinse the diapers to remove all excess of soap and also to boil them for a long time to eliminate the possible influence of bacterial action.

Treatment of Congenital Syphilis in Infants and Children.—Dr. WALTER R. RAMSEY and Dr. O. A. GROEBNER, of Minneapolis, presented a communication on further progress in the study of the relative efficiency of the different mercurial preparations in the treatment of congenital syphilis in infants and children as determined by a quantitative analysis of the mercury elimination in the urine. The paper was read by Dr. Ramsey who said that the treatment of syphilis with the different mercurial preparations was still a haphazard affair, the rule being to give as much mercury as the patient would tolerate without salivation or diarrhea. Assuming that the amount of mercury eliminated in the urine during a given time would give a fair index of the amount in the circulation, Dr. Ramsey and Dr. Ziegler had made some experiments, the report of which was read before this society in 1918 and had been published. In these experiments it was demonstrated that mercury, whether given by inunction, by mouth or by hypodermic injection, was eliminated in the urine in appreciable amounts. Where only one dose was given by any of these methods mercury continued to be eliminated in the urine for a variable time and in one case as long as ten days.

In this new series of experiments, they had sought to determine with some degree of accuracy the amount and rapidity of absorption and elimination of the common mercurial preparations in common use as determined by quantitative estimate of the

amounts eliminated in the urine. The method was the same as that employed in the previous experiments.

The practical deductions which might be drawn from this series of experiments were as follows: 1. Mercurial ointment fifty per cent. was to be preferred to the less concentrated preparations and should be repeated not more often than twice weekly instead of daily. 2. Calomel ointment was absorbed but less rapidly and to a less extent than mercurial ointment and should therefore be given in greater concentration twice weekly. 3. The salicylate of mercury in oil should be given hypodermically twice weekly instead of once. 4. The mercury chloride administered by hypodermic injection, although the dose was very small, continued to be eliminated for several days, but owing to the fact that its use was frequently followed by the appearance of protein in the urine should exclude it from the treatment of syphilis. 5. Calomel by the mouth was absorbed in small amounts and continued to be eliminated for a considerable time, therefore it was probable that it would be sufficient to give it at intervals of several days without producing diarrhea. 6. Gray powder was absorbed to a small degree and eliminated rapidly so that fairly large doses repeated daily would probably be necessary to maintain mercury in the circulation. Experiments were being continued to determine, if possible, whether the clinical results would bear out the observations made in this paper. In one case of congenital syphilis treated by inunctions, and not repeated oftener than once weekly, the clinical progress was apparently not less satisfactory than in cases in which daily inunctions were given.

A Study of the Incidence of Hereditary Syphilis.—Dr. P. G. JEANS and Dr. J. V. COOKE, of St. Louis, made this study which was aided through a grant from the U. S. Interdepartmental Social Hygiene Board. The material was collected from several sources, being almost equally divided between charity and private patients. The results presented were based on data collected from the first one thousand cases and as many of these as possible were examined at the end of two months. In these, histological examination of the placenta as to the presence or absence of syphilitic changes corresponded to the established diagnosis in 95.5 per cent. of the cases. The lack of correspondence consisted entirely in finding no syphilitic changes in the placenta in cases in which the infants had syphilis. In every instance in which the placenta was noted as having syphilitic changes the infant was found later to have syphilis. In this group of cases in which the diagnosis was established, the Wassermann reaction on the placental cord blood corresponded to the diagnosis in the infant in 96.5 per cent. Here also the discrepancies were entirely due to finding a negative Wassermann reaction in the fetal blood in instances in which the infant was syphilitic. In every instance in which the fetal blood gave a positive Wassermann reaction the

infant was later found to have syphilis. Of the 1,000 cases, 574 were of the dispensary or poorer class, and in this group there was an estimated incidence of syphilis in 9.6 per cent. Classified according to race, the incidence among negroes was 14.4 per cent., and among the whites 5.8 per cent. The observations tended to confirm the reliability of these methods and established the justification of applying either or both methods in making estimations. Among private patients able to pay a physician's fee and private room rates in a hospital, the estimated incidence based on an examination of placentas was 1.4 per cent. Including the doubtful cases the incidence was 1.9 per cent. Estimating the incidence from the Wassermann reaction on the cord blood, it was found to be 1.6 per cent., again showing the close agreement between the two methods. In some instances in which the infant had syphilis the maternal Wassermann alone was positive, in others the placenta alone. Therefore, in order to give a clean bill of health to an infant at birth it was necessary that all three examinations, maternal Wassermann, placenta and cord blood, should be negative. The fact that the treatment of the mother during pregnancy would result in a nonsyphilitic child had been confirmed by these observations. The total incidence of syphilis in the whole group was six per cent. It was their belief that the whole group fairly represented a cross section of the population of St. Louis, and if such was the case the incidence of hereditary syphilis at birth was six per cent.

A Study of Pneumonia in Infants and Children during the Recent Epidemics.—Dr. HENRY HEIMAN, of New York, presented an analysis of 336 cases of pneumonia admitted to the pediatric service of Mt. Sinai Hospital during the pandemic of influenza. Not all of these cases were influenza pneumonias; there were 288 bronchial pneumonias and forty-eight lobar pneumonias. The mortality was 16.6 per cent. With the exception of the two to five year period the mortality varied inversely as the age. A variety of organisms had been found in the sputum, including the influenza bacilli, pneumococci, streptococci, staphylococci, but none in sufficient predominance to justify conclusions. The x ray had been found to be of valuable assistance in the diagnosis of both types of pneumonia. The most frequent complication was otitis media which occurred in seventy-five of the 336 cases. Empyema developed in seventeen cases. When this complication occurred Dr. Heiman had advised against early operation before the acute stage of the pneumonic process had subsided.

Of prime importance in the treatment of pneumonia in children were hygienic care and efficient nursing, a bright sunny room and an abundance of fresh air, quiet surroundings and close supervision. Vigilance should be exercised to protect against infection of the eyes, skin and mouth. A cleansing bath should be given each morning as a routine measure. While fresh air was very necessary, the author did not favor the cold air treatment. It was important that the digestive tract should receive the closest attention. Milk of magnesium as an enema might be given at night. As a stimu-

lant aromatic spirits of ammonia might be given. In the moderately severe cases with high temperature hydrotherapy might be employed in the form of warm packs. In toxic cases atropine and adrenalin might be given. The promiscuous use of dry cupping was to be condemned. Dr. Heiman did not recommend the general use of digitalis in children, since as a rule the pulse was not lowered or the blood pressure raised by this agent. It was to be hoped that there would be a further differentiation of types of pneumonia in infants and children with the hope of securing specific therapy.

Lesions in the Midbrain.—Dr. J. H. M. KNOX, JR., of Baltimore, reviewed the anatomy of the midbrain and referred to the difficulty of distinguishing between symptoms that might be due to the destruction of nerve tissue by disease and those which were produced by alteration in function in the same area because of the involvement of neighboring structures. The syndromes of Weber, Benedict, and Nothnagel were described. In view of the confusing symptomatology often noted in patients suffering from midbrain lesions the case reported, in which the symptoms were comparatively definite and the pathological findings fairly circumscribed, was of interest. The patient was a colored boy, three years of age, brought to the Harriet Lane Home, Johns Hopkins Hospital, on February 3, 1915, because of general weakness, trembling, and drooping of the eyelids. The family and personal history of the patient were negative, the boy appeared perfectly normal until six months before admission, when he stopped crying almost completely. About four months later the tremor was noted and a little later the drooping of the eyelids. The outstanding abnormalities revealed by physical examination were some enlargement of the epitrochlear glands and the eye symptoms. The pupils reacted to light, the left better than the right. There was occasional lateral nystagmus of the right eye, marked bilateral ptosis of the eyelids, apparently equal on both sides, and a definite deviation of the eyeball to the right. Two weeks later the patient returned with the history of having had two attacks of paraplegia, having become very weak and limp after the second one. The symptoms before noted were increased. There was great uncertainty of movement and an examination of the fundi showed a very slight degree of secondary atrophy.

The spinal fluid was under marked pressure, gave a reaction for globulin, and contained an increased number of cells, mostly mononuclears. The x ray examination of the head showed a moderate hydrocephalus and a probable tumor above the sella turcica. About ten days after his admission a slight rigidity of the neck was noted, and from that time on the child grew constantly weaker, and there were slight daily fluctuations of temperature of about two and a half degrees. He died after being under observation for forty-two days. The acquired ptosis, the curious tremor of long standing noted in the extremities, and the gradually developing paralysis of the movements of the eyeballs, except those produced by the external recti with resulting external strabismus, in a child previously well, led one to venture the diagnosis of a tumor of the mid-

brain, interfering with the nuclei of the third and fourth cranial nerves. The ataxia might also be accounted for by lesions in this region, involving the red nucleus or cerebellar tracts. Toward the end there was certainly meningitis, probably of tuberculous origin, associated with hydrocephalus, although the tubercle bacillus was not demonstrated. The positive von Pirquet reaction and the subsequent development of meningitis suggested that the tumor was probably tuberculous in origin.

The postmortem findings were given leading to the anatomical diagnosis of solitary tubercle of the midbrain and right parietal lobe, together with tuberculous meningitis. The anatomical findings confirmed in the main the clinical symptoms described. The writer further discussed the affections produced by midbrain injury, and also the symptomatology of pineal tumor, which was identical with that of primary lesions of the midbrain. The order in which the symptoms developed was of the utmost importance in reaching an accurate diagnosis. When the early symptoms were general and attributable to increased cerebral pressure, such as headache, vomiting, optic atrophy, and hydrocephalus followed, it might be with ptosis and oculomotor palsies, one would be inclined to place the initial lesion outside of the midbrain, such symptoms might result from meningitis or tumor elsewhere, possibly originating in the pineal gland. Whereas, as in the case of the boy here reported, the limitation of the symptoms for months to ptosis and paralysis of the oculomotor nerves and tremor without evidence of intracranial pressure supported the diagnosis of an injury beginning in the midbrain and as far as it went the absence in this case of an increase of growth or of sexual development suggested that neither the pineal nor pituitary glands were involved.

Dyspituitarism, So-called: Absorption of Membranous Bones, Exophthalmos, and Polyuria.—Dr. ALFRED HAND, of Philadelphia, recalled a case which he had reported in the *Transactions of the Pathological Society of Philadelphia*, Vol. XVI, 1891-93, under the heading General Tuberculosis, and also in the *Archives of Pediatrics*, Vol. X, 1893, under the title of Polyuria and Tuberculosis. The patient was a boy three years old, seen December 1, 1892, with a history of great thirst and polyuria of sudden onset eight weeks earlier. He had had enterocolitis at the age of eight months, and croup and measles at the age of two years. The family history was negative. The boy was undersized, with a dry bronzed skin, exophthalmos, corneal opacities in each eye, and anterior synechiæ in the right. The thyroid was not enlarged. There had been rachitis. The urine had a specific gravity of 1,000 and the maximum quantity in twenty-four hours was 150 ounces, containing neither sugar nor albumin. After two months the boy died of bronchopneumonia, the main feature of autopsy being a yellow area of softening in the right parietal bone involving both tables of the skull, with other areas affecting only the outer table. The kidneys were enlarged, the left had three small cysts, and in the pelvis of each was a hard, tuberculous mass; the lungs showed bronchopneumonia, and there was

small round celled infiltration of the liver, spleen and kidneys, with degeneration of the epithelium of the uriniferous tubules.

Dr. Hand quoted the notes of a case shown before the Medical Society of the State of Pennsylvania, in 1906, by Dr. T. W. Kay, and reported by him as a case of acquired hydrocephalus, with atrophic bone changes, exophthalmos and polyuria. In the Osler Memorial Volume there was an article entitled Defects of Membranous Bones, Exophthalmos and Polyuria, an Unusual Syndrome of Dyspituitarism, by Dr. Henry A. Christian, who reported such a case and had found two similar ones described by a German writer, Schüller. The latter said: "We can, therefore, make a presumptive diagnosis of anomaly of the skeleton as a result of disease of the hypophysis." Dr. Christian treated his patient with pituitrin, which, when given under the skin and into a vein, caused great diminution in the amount of fluid ingested and excreted, but, given by mouth or rectum, had no effect. Dr. Christian also concluded that the condition was due to disturbed pituitary function.

Dr. Hand added to the group a sixth case which he had seen recently. This patient was a boy, four years of age, from whom there was removed at the age of two years a tumorlike swelling from the left parietal region; there was absence of bone beneath the tumor down to the dura. Section showed a slight degree of inflammation, but mainly a myxomatous change. Since then other swellings had appeared, and exophthalmos which was greater on the right, but as yet there had been no polyuria.

Analysis of these six cases seemed to render the theory of dyspituitarism insufficient to explain the syndrome, although the polyuria undoubtedly depended on a disturbance of the hypophysis; the bone changes seemed to be the primary condition, causing the exophthalmos mechanically by changes in the orbital plates, and the polyuria by changes in the sella turcica. The cause of the bone changes was not clear, and further observations were needed before this interesting and curious group of symptoms could be satisfactorily explained.

Use of Fresh Vaccines in Whooping Cough.—Dr. ROWLAND G. FREEMAN, of New York, stated that vaccines for the prevention and cure of whooping cough had been used for the past eight years, and, while some enthusiasm had been shown, the general opinion had been that they were of but little service in the treatment of whooping cough, although possibly of some value in its prevention. His own attitude was that they did not modify the course of whooping cough, and he had never seen a case of whooping cough apparently prevented by their use.

Two years ago he saw Dr. Hueneken's paper on the application of the complement fixation test for the detection of antibodies after the injection of whooping cough vaccines, in which he showed that the antibodies were not present unless the vaccines were freshly prepared, and that after a week of storage but little antibody protection resulted from their injection even in large doses. It seemed to him that this fact might explain the contradictory reports from the use of whooping cough vaccines

in the course of their work. He felt that it should be tried out. He was, however, unable to report any institution work, but had brought together all the cases in which he had used it in private practice, hoping to stimulate interest in these fresh vaccines and thus render it easier to obtain them. If we were to have an opportunity to give the vaccines a fair trial we must have a laboratory producing fresh vaccines every week.

The present series of cases, which Dr. Freeman reported, included sixteen children with whooping cough, in whom the vaccines had been used at various periods of the disease. In five cases no results were obtained. In three of these cases the vaccines were used early in the disease, and in the other two, very late. Of the eleven remaining cases, in nine a material improvement took place and in four a practical cure was obtained. His confidence in the vaccines had been somewhat shaken by the results in one family of six children, reported in this paper, who failed to react, but the good results obtained in other cases and the quite remarkable results obtained in certain beginning cases convinced him that these vaccines should have an extended use, particularly in institutions, where control might be used to demonstrate whether we might not have in these vaccines a valuable method of reducing the large mortality from whooping cough.

Some Observations on Rickets.—Dr. JOHN HOWLAND and Dr. EDWARDS A. PARK, of Baltimore, presented a contribution on this subject, which consisted of a lantern slide demonstration showing the alterations at the junction of the shaft and cartilage in rickets, as determined by the x ray. A definite correlation was shown between the x ray signs and the actual pathological conditions. Proof was adduced that the calcium deposits in the cartilage cast well defined shadows. The effectiveness of cod liver oil as a therapeutic agent in rickets was demonstrated by serial x ray pictures. In animal experiments a beginning calcium deposit was demonstrated two days after beginning the administration of cod liver oil. In human beings the calcium deposit in the cartilage was definitely demonstrable at the end of three weeks after beginning the administration of cod liver oil. The probable relation of cod liver oil to the process of repair was discussed.

Hypertrophic Stenosis.—Dr. H. M. McCLANAHAN, of Omaha, stated that since June, 1919, he had had under his care six cases of congenital hypertrophic stenosis complying with the following syndrome: Loss of weight; vomiting several times a day, frequently expulsive in character; stools small, dark, and without any evidence of milk digestion; visible peristaltic wave, and scanty urine. In three or four patients recovering without operation a movable tumor could be palpated. In one of the patients not operated upon the diagnosis was further confirmed by an x ray plate. Four of the six patients recovered under gruel feeding, their ages being five, five; seven, and eleven weeks. These infants were placed on thick gruel in the manner described by Dr. Sauer and later by Dr. Langley Porter. The rate of gain varied, but all made slow

but steady improvement. The fifth baby made fair progress for two weeks, but the parents, seeing the results in the next case reported, demanded operation. This baby was operated on and made a good recovery, but it was Dr. McClanahan's belief that this baby would have recovered without operation. The sixth patient was in desperate condition at the time of operation, the walls of the stomach being dark in color, in striking contrast to that of the intestines. This infant had congenital hypertrophic stenosis, general staphylococcus infection, and acute gastritis. The case would undoubtedly have terminated fatally without operation.

Focal Infections in Children.—Dr. OSCAR M. SCHLOSS stated that this report concerned cases of focal infection of the tonsils which were responsible for two types of disturbances. In one group of cases, the disturbances were cyclic in character, were accompanied by fever and persistent vomiting, with a large elimination of acetone bodies in the urine and an accumulation of acetone bodies in the blood. There were eight cases in this group. The other type of disturbance was evidenced by mild nephritis. The urine contained albumin in moderate amounts, red blood cells, hyaline and granular casts, and some leucocytes. These children were not especially ill. The symptoms were traced to a tonsillar infection and subsided promptly when the infected tonsils were removed. Two such cases were observed. In most of the cases in both groups the tonsils were not large. In several instances the tonsils had been previously removed and there remained only a small amount of tonsillar tissue between the faucal pillars.

Sarcoma of the Kidney.—Dr. ROWLAND G. FREEMAN, of New York, stated that this case was of interest because of the rapid production of metastases after operation, and also because of the type of tumor. The child was two and a half years of age and weighed twenty-six and a half pounds. When she came under observation she had been failing in health for two months. X ray examination confirmed the diagnosis of tumor of the kidney on the left side. Six weeks after operation she was brought back to the hospital in a desperate condition, with a temperature of 102° F., dyspnea, and râles over the entire chest. The x ray showed numerous metastases in the lungs.

A Case of Portal Thrombosis.—Dr. RICHARD M. SMITH, of Boston, stated that portal thrombosis was a rare condition in children. This patient, a child three years old, gave a history of acute rise in temperature with a cough of seven days' duration at the time of admission. The striking points in this case were the persistent fever, the enlarged liver and spleen, engorgement of the superficial abdominal veins, severe anemia, and intestinal hemorrhage. No diagnosis was reached during life. At autopsy thrombosis of the portal vein and its great radicles was found, with passive congestion of the spleen, ascites, hypertrophy and dilatation of the heart, edema of the lungs, and anemia. Undoubtedly the thrombosis was of infectious origin arising in connection with the initial infection of the respiratory tract.

(To be continued.)

